ENGINEERING NEWS-RECORD

Kansas Turnpike on the move *p. 36*

U. S. POWER
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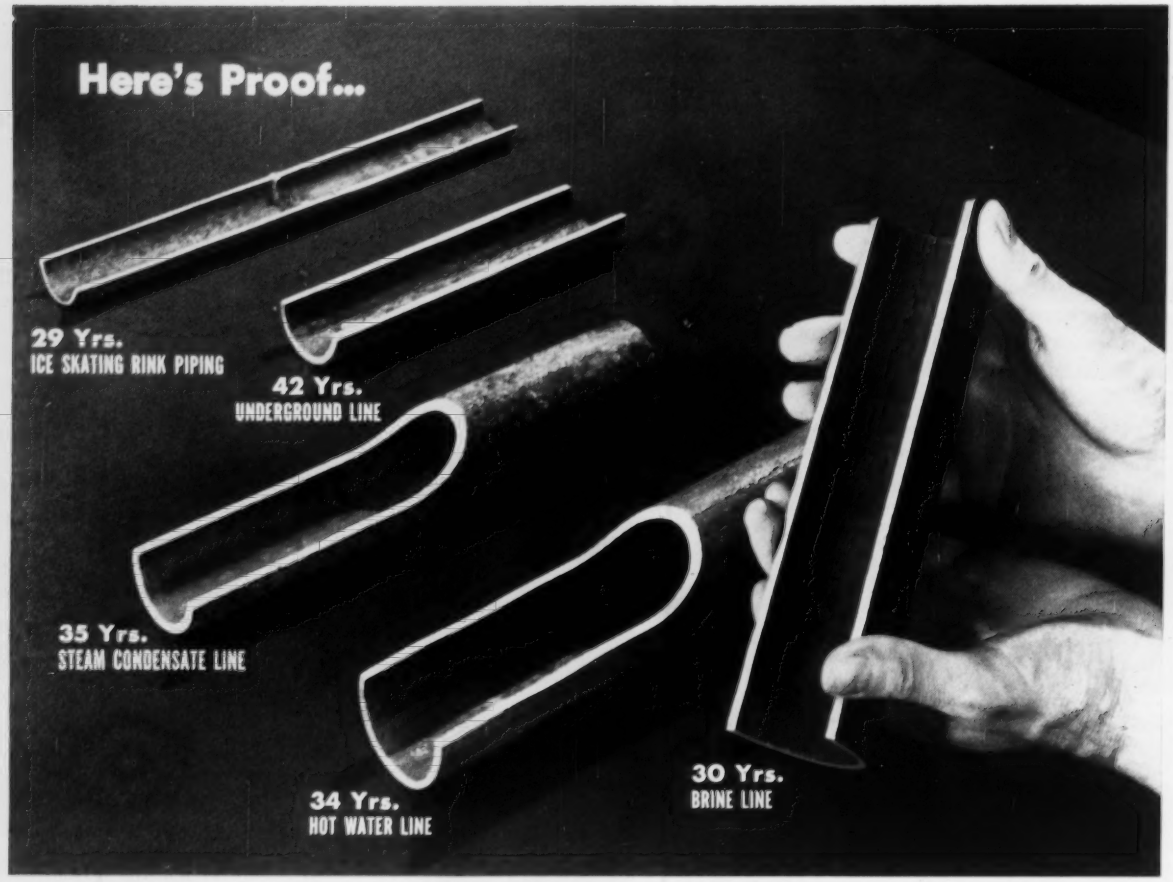

WROUGHT IRON PIPE Saves because it Serves longer

True, there's no set rule for predicting how long a pipe material will last in any corrosive service. But there are a lot of mighty dependable clues. The most practical and dependable of all is *service under actual field conditions.*

How does wrought iron pipe measure up when this service-life yardstick is applied?

The answer is documented in the pipe sections shown above. Here you see *actual* samples taken from wrought iron pipe installations in a variety of services. Some of these sections came from buildings that were being torn down. Some were actually cut from in-use installations by our laboratory staff. These sections are interesting not only from the viewpoint of service life, but also pipe condition.

You'll find the reason for wrought iron pipe's ability to last longer in the material's structure and composition. Tiny fibers of glass-like iron silicate are threaded throughout the body of high-purity iron. These fibers are immune to corrosive attack. When corrosion strikes, these fibers halt and detour the attack, prevent rapid pitting and penetration. When you consider that there are more than 250,000 of these fibers to each cross-sectional square inch of wrought iron, it's easy to understand why this material is more than a match for corrosion.

Our bulletin, *Piping for Permanence*, tells more of this story, and covers a variety of services where wrought iron pipe saves because it serves longer. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N. Y.

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BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY STEEL PRODUCTS

100 tons of limestone and flint rock per hour on this job . . .

using MURPHY DIESEL POWER all the way

● From this Kansas pit, W. O. Homer of Junction City, Kansas, is turning out 100 tons of limestone and flint per hour, with flint accounting for about 20% of the total. Mr. Homer is doing this job with a Murphy Diesel powered Northwest shovel and a Murphy Diesel powered Universal portable crushing plant. So it's Murphy Diesel all the way on this job.

If you're looking for dependable output at maximum operating economy, profit by the experience of pit and quarry operators everywhere, and put Murphy Diesel power to work for you. It's your best bet for getting the most rock per gallon of fuel and you'll particularly like the trouble-free service and freedom from costly downtime.

Talk over your requirements with your Murphy Diesel Dealer and ask him to show you what Murphy Diesel power can do for you.

297A

Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units are available in sizes from 96 to 264 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY
5321 W. Burnham Street
Milwaukee 14, Wisconsin
Sales, parts, service throughout the nation

Symons FIELD REPORT...

Symons Forms, Shores and Column Clamps Used On 525 Ft. Aqueduct at Streator, Illinois...

to carry a 27-inch pipe across a ravine.

Symons solved the difficult task of setting up to pour concrete around the vitrified tile pipe, averaging 225 pounds per foot. Weight of pipe and poured concrete is over one ton per lineal foot.

Footings 7' x 7' and 1'3" thick were first built for the concrete piers spaced 25 feet apart. Symons Column Clamps were used to form the piers—12" x 24" at the base, 12" x 48" at the top and range in height from 10 to 19 feet.

The aqueduct is 4'3" wide and four feet high. Symons Forms with steel cross members and 51-inch ties were used to form the sides, which were supported by one set of walers.

Three-quarter inch plywood formed the beam bottom, resting on 4" x 4" joists. Girths 4" x 6" were spaced every four feet and supported by Symons Safety Shores. Warren & Pragg, Decatur, Illinois, was the architect and Central Ironite Waterproofing Company, Maywood, Ill., was general contractor.

Symons Forms, Shores and Column Clamps can be rented with purchase option, all rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4265 Diversey Ave., Dept. B6, Chicago 39, Ill.

View showing completed piers and aqueduct

For More Information on FORMS—CLAMPS—SHORES Write for Literature

ENGINEERING NEWS-RECORD

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CONTENTS ON PAGE 37

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Robert F. Boger
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We made 'em TOUGH then... but they're TOUGHER today!

THE two pictures of Northwest Pullshovels on this page were made within a few weeks of each other. Take a look at the digging these machines are in.

The picture at the top shows a venerable Northwest Model 4 that has recently had its 27th birthday. It is shown laying bituminous coated pipe through rock on a sewer job at Bedford, Indiana.

The picture to the left, shows a Northwest Model 25 that is just a year-old youngster.

You can handle a lot of jobs with light equipment but what do you do when you're up against digging like this? The fact that you can take a 27-year old rig, built when no one thought of putting a pullshovel in rock, and get output in digging like this, illustrates what Northwest Plus Production means, better than anything.

We built 'em tough *then*, but we build 'em *tougher* today. Today as always they are built for the tough work and they bring you all the stamina that the best in modern engineering and design can bring. If you are planning on new Shovel, Crane, Dragline or Pullshovel equipment, talk it over with a Northwest man.

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1502 Field Building • 135 South LaSalle Street
Chicago 3, Illinois

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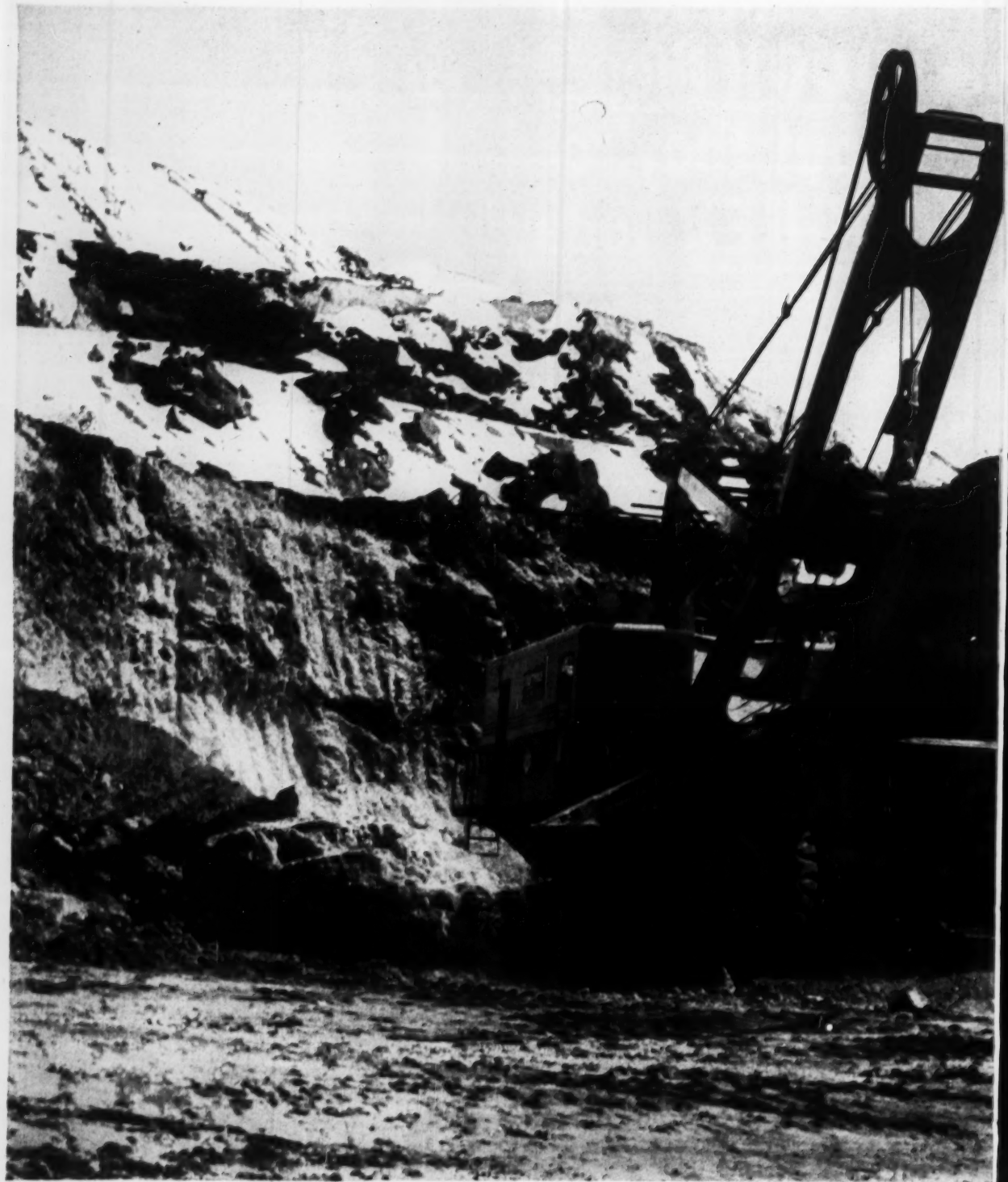
NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



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starring
JIMMY DURANTE
on TV Saturday nights.
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Saturday afternoons.

TEXACO

TEXACO

When Marfak goes in . . . dirt stays out

TEXACO MARFAK keeps bearings clean, seals out dirt and dust. It won't jar or squeeze out, even under heavy shock loads. And *Texaco Marfak's* tough, moisture-proof film guards against wear and rust. All chassis parts last longer . . . you enjoy high operating efficiency and low maintenance costs.

In wheel bearings, use *Texaco Marfak Heavy Duty*. While sealing out dirt and moisture, it seals itself in. That means safer braking and protection that lasts for thousands of extra miles, with no seasonal change required.

If you want *just one lubricant* to handle all chassis, wheel bearing, water pump and other grease lubrication — *Texaco Marfak Heavy Duty Special 2* is the answer. This new, lithium-base member of the famous *Marfak* family pumps easily at low temperatures and lubricates effectively over a wide temperature range. It resists water washing, stands up under the most rugged service.

More than 600 million pounds of Texaco Marfak have been sold

For transmissions and differentials, *Texaco Universal Gear Lubricant EP* assures smooth, quiet gear operation — lower upkeep costs.

On crawler mechanisms, use *Texaco Track Roll Lubricant* — noted for its full protection against mud and moisture, its ability to prevent rust and reduce wear.

A Texaco Lubrication Engineer will gladly recommend the proper lubricants to help you increase efficiency and bring down costs throughout your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO SIMPLIFIED LUBRICATION PLAN: Saves you time, worry and money . . . reduces your lubricant inventory. With *no more than six* Texaco Lubricants, you can handle *all* major lubrication on any project. Ask your Texaco Lubrication Engineer for full particulars.

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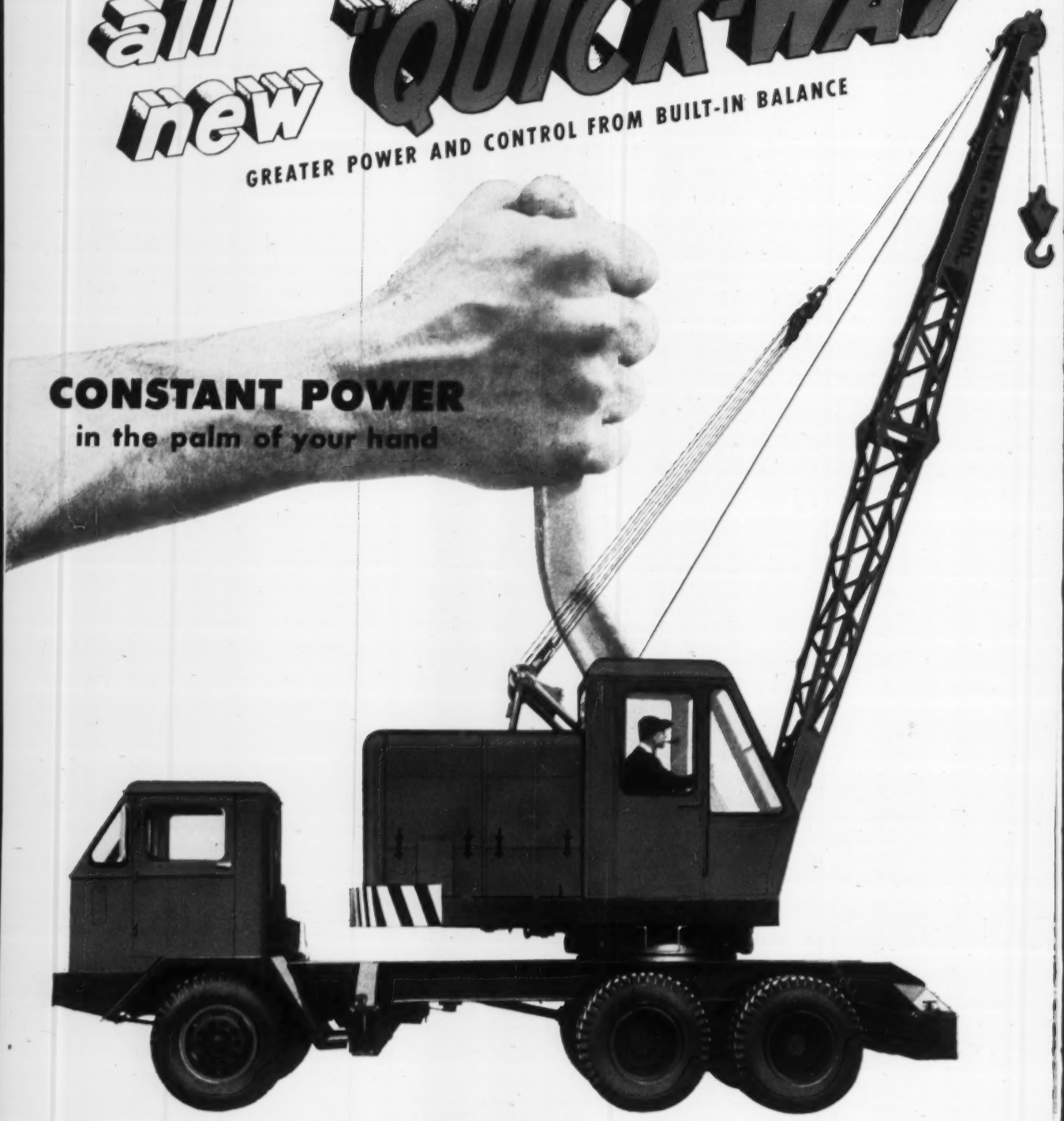
the all new "QUICK-WAY"

GREATER POWER AND CONTROL FROM BUILT-IN BALANCE



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¼ Yd. 5 Ton	⅜ Yd. 8 Ton	½ Yd. 10 Ton	½ Yd. 12½ Ton

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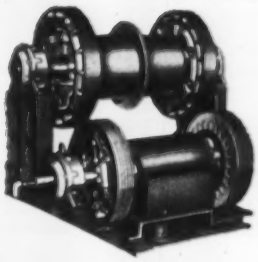
with MORE Big Shovel FEATURES



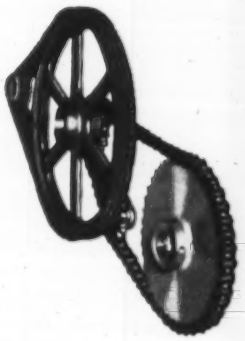
MAIN ASSEMBLIES

Power up and down boom standard on all models.

High tensile steel shafting. Any one main assembly removable without tearing down others. Positive control shaft centers for 100% clutch and brake action.

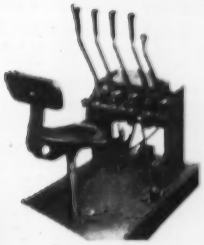
AIR COOLED DRUMS

Large size, louver-ventilated, ductile iron clutch and brake drums, finned-ventilated swing assembly drums . . . specially designed for cool, continuous running at top efficiency.



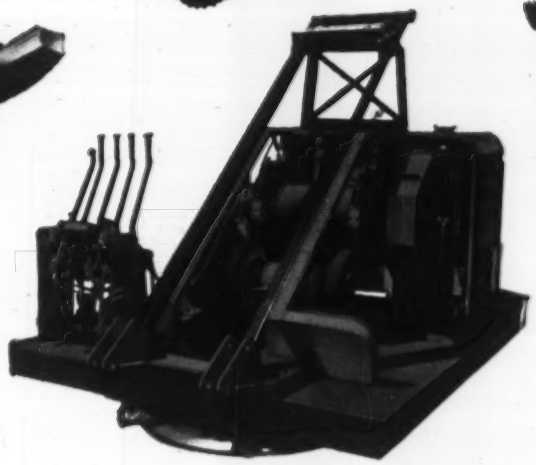
ALL CHAIN & SPROCKET DRIVE

Machine-cut steel and cast iron sprockets with compact, high-speed, heavy-duty roller chains give positive power, reduced noise, and greater flexibility under every operating condition. Oil and dust tight cases.



CLUTCH CONTROLS & HYDRAULIC SYSTEM

Smooth, positive minimum-effort control from new hydraulic system. New design control lever locks.



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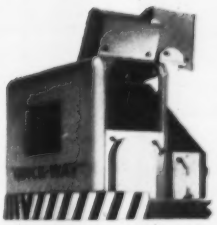
Daily grease fittings centrally located on cab panel. Intermittent grease fittings easily accessible. Positive grease and dirt seals at all revolving points. Force-feed, filtered, circulating lubrication on all chain and sprocket drives and on main shaft bearings. Main bearings also running in oil.

ANTI-FRICTION BEARINGS

Self-aligning, anti-friction bearings on all high-speed, continuous, rotating shafts and drums. Special long-life, alloy bronze bearings on swing rollers and center rotating sleeve.

COMFORTABLE FULL VISION CAB

All operating controls, including instrument panel and lock throttle, conveniently located in front of operator. Safety glass windows on all sides and top insure full vision—sliding and hinged windows provide maximum ventilation.



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THE CAPITOL TOWER, spectacular new home of hi-fi Capitol records, dominates the heart of Hollywood, California.

First circular office building in the world, it was designed by architect Welton Becket; contractor is C. L. Peck. The $2 million structure is 13 stories high, acoustically engineered for minimum sound disturbance; has underground reverberation chambers with foot-thick concrete walls buried 25 feet into the earth.

NEED A KILN GUN?

Designed to dislodge clinker rings from rotary kilns, Western's Kiln Gun (now sold by Ramset) removes all types of stubborn, inaccessible obstacles. Write for complete details.

No matter what the construction problem, if it requires fastening to steel or concrete, RAMSET will do it better, faster, cheaper. Ask for new free catalog, just ready for you.

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. . . Reader Comment

Resurfacing Streets

SIR—Your article on the operation of resurfacing some of Minneapolis's streets (ENR Oct. 13, p. 36) makes an interesting construction story. I believe the city engineer is to be commended. Having battled contractors for some 30 or more years, I can see where such street repairs would induce a contractor to ask for pay for extra work, which in many instances would be hard to arrive at quantitatively after the job was completed.

If both a longitudinal and transverse profile were not made before the work started and all "pot holes" were not measured, it would afford the contractor the argument "I just know, due to the roughness of the original surface and due to the undulations of the old pavement, I have placed more material than the plans call for." Then if the "extra work" bill is not settled according to the contractors figures, the engineers would wish they had made a profile both longitudinally and transverse at a couple of foot intervals and had a picture of all the "pot holes" with location and dimensions shown.

In instances long past this commentator has gone over similar finished jobs and has dug test holes in the finished work at locations chosen by the contractor and could never up any quantities by any appreciable amount.

Now comes a letter by Patrick J. Sheehy, civil engineer, Norristown, Pa. (ENR Dec. 8, p. 10) entitled "Socialism on Local Level." This disturbing cry of socialism is rather old, is it not?

F. E. RAMSEY
Columbia Falls, Mont.

"Reasonable Grounds"

SIR—Your editorial (ENR Jan. 12, 1956, p. 100) favoring approval of the proposed revision of the ASCE code of ethics states that ". . . it (the proposed revision) recognizes that

(*Continued on page 12*)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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HORIZONTAL SHORING

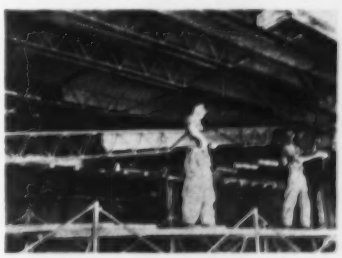
Patent Pending

. . . cuts cost of concrete floor forms up to 40%

S-L Spanall—newest of all-metal, adjustable supports used in suspended formwork—has been generally available for only a few months. Yet it is now being specified and used by engineers and contractors in all parts of the country.

The overwhelming demand for S-L Spanall is due to the time, labor, safety and cost saving ease with which the supports are assembled and the camber adjusted for any given load. It takes but a couple of men to position the supports and set up the forms. And S-L Spanall eliminates cumbersome timber shoring . . . provides the tremendous advantage of clear, unobstructed work areas on floor below . . . has a safety factor of 2.17 and substantially reduces the builder's fire hazard.

S-L Spanall is available immediately for sale or rent. Detailed information and consultation upon request. Please address your inquiry to Dept E.



Stripping S-L Spanall supports from YMCA Annex in Syracuse, New York. With the web-plate sections telescoped into the lattice sections, S-L Spanall is conveniently stored or shipped for re-use elsewhere.

UNIVERSAL BUILDERS SUPPLY COMPANY, INC.

51 East 42nd Street, New York 17, N. Y.

Have you asked these questions about steel water pipe?

Q. Why do you steel pipe people say that your large-diameter pipe is better than pipe made of other materials?

A. Because steel pipe carries high pressures safely; it has and maintains a high carrying capacity; it is the strongest pipe by far—and this is proved *by hydrostatically testing every length of steel pipe.* This strength, coupled with the resilience of steel, means that steel pipe can withstand external and internal stresses that commonly cause failure in pipe made of rigid materials.

Q. How about cost—isn't steel pipe high?

A. Not at all! When you figure the cost *installed in the ground*—and that, of course, is what counts—a steel pipe line often costs less than other types. Remember that steel pipe comes in 40-ft lengths. It can be laid faster than short pipes. And these 40-ft lengths weigh less than 16-ft lengths of other material. You can use lighter and less costly field equipment.

Q. But how about the long-term costs. Won't steel pipe corrode and tuberculate, and require cleaning?

A. You have no worries there. There are plenty of examples of large-diameter steel pipe maintaining high-flow capacity for forty or fifty years and more. For instance, a 42-in. line installed in 1909 at Springfield, Mass., had a Hazen and Williams flow coefficient "C" of 111 in 1950. Their 54 and 58-in. lines laid in 1929 tested 140. And, remember, when those lines were installed they didn't have our modern coating compounds and methods of application. The pipe we make these days, coated inside and outside with coal-tar enamel, will give wonderful service indefinitely.

Q. You say steel pipe is resilient. It "gives." Won't the pipe walls collapse under the weight of cover?

A. Definitely not. As a matter of fact, steel's resilience allows steel pipe to deform enough to keep contact with the surrounding earth, which in turn takes the strain off the pipe. Rigid pipe, on the other hand, takes the entire load. It can't transmit the load to the earth, or conform when fill is washed away, and it frequently breaks. No doubt about it, steel pipe is far more resistant than any other type to damage from external forces. And that includes heavy cover, vibration, blows, explosions, washouts, etc.

Q. Will steel pipe leak? Are the joints tight?

A. You definitely can get the tightest joints with steel pipe. When you use couplings or welds, your line can be 100 pct leakproof.

Q. How about working pressures? Other types of pipe are advertised as "pressure pipe."

A. Let us answer in this way:

First—no other pipe can even come close to steel pipe in its ability to handle high working pressures. The *nominal* bursting pressure for 48-in. ID steel pipe with $\frac{3}{8}$-in. walls, for instance, is 780 psi. Yet you'd probably use pipe that size to handle working pressures of only 100 to 150 psi. You can easily figure the margin of safety. No other material can give you the same factor of safety for the same price.

Second—steel pipe is *actually tested after fabrication* for its ability to carry high pressures. Every single length of steel pipe is hydrostatically tested in the shop, usually to twice the working pressure, according to AWWA standards.

Which can properly be called "pressure pipe?" Well, you be the judge.

Q. Who uses steel pipe?

A. Hundreds of water systems in this country and throughout the world are using steel pipe today and have used it for many years. Some current customers for Bethlehem Steel Pipe are New York City, Philadelphia, Baltimore, Toledo, Minneapolis, Boston, Cleveland, Omaha, New Orleans, Duluth, Atlanta, St. Louis, Worcester, Mass., Winston-Salem, N. C., Ft. Smith, Ark., Reading, Pa., and Decatur, Ga., to name just a few.

Q. Where can I get further information?

A. Just call the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

More batches per shift . . .
More accurate batching . . .
for every big highway job
with

BLAW-KNOX BATCHING PLANTS

Speed—to build roads faster!

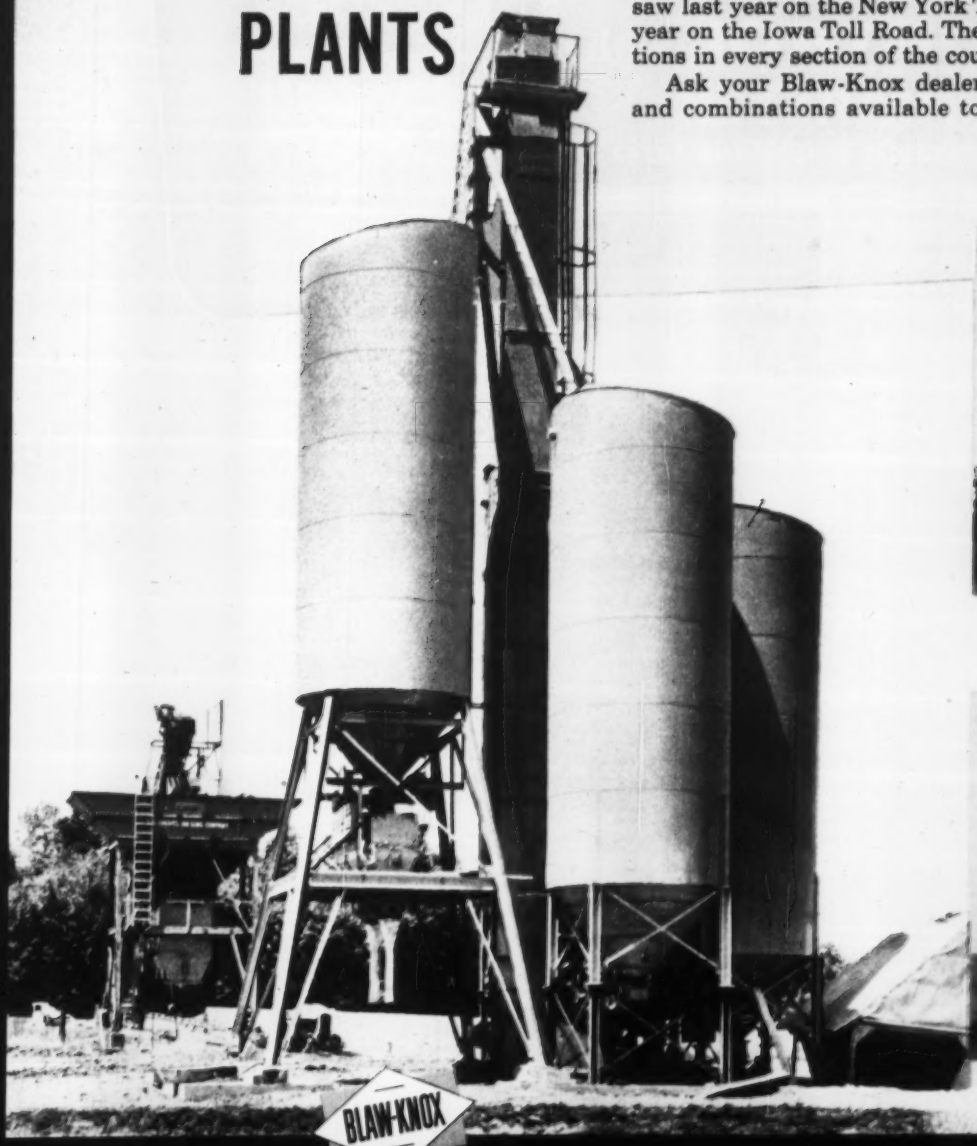
Accuracy—to meet exacting specifications!

That's what you need in batching plant operations for every section of the country where there's a road a-building.

And that's what you get with Blaw-Knox Batching Plants! Blaw-Knox batching speed comes from over-all *balanced* construction . . . operation of each component fits the others with dove-tailed precision. That Blaw-Knox *better* design and construction assures accuracy, another important consideration when you have to meet specs allowing ¼ of 1% tolerance, as the plant illustrated did for one owner on the Ohio Turnpike.

Wherever you see a big turnpike project, you'll see Blaw-Knox batching plants. Perhaps the same ones you saw last year on the New York Thruway, you'll see next year on the Iowa Toll Road. They're adaptable to conditions in every section of the country.

Ask your Blaw-Knox dealer about the many sizes and combinations available to make money for you.

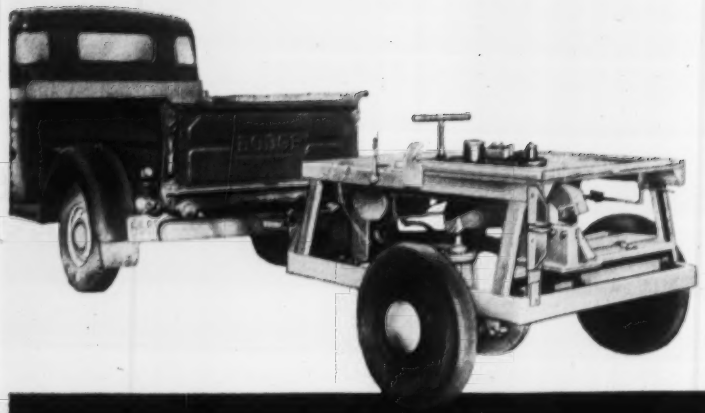


400 bbl. Hi-Bin and Cement Batcher fed by Blaw-Knox Elevator keep trucks rolling at a profitable rate.

100-ton, 3-compartment Aggregate Bin with twin batcher meets high speed paving requirements.

BLAW-KNOX COMPANY

Construction Equipment Division • Mattoon, Illinois



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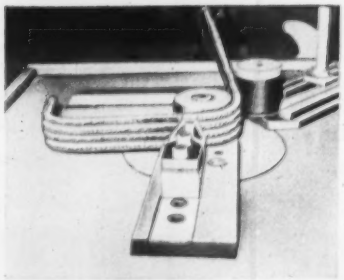
SCHEDULES MET — The IRONMASTER eliminates waiting for pre-fabricated bar deliveries and delays caused by changes or errors in specifications. The IRONMASTER combines precision power bending and shearing of all sizes of reinforcing bars in a single, compact and fully portable unit. Complete, fast and accurate on-the-job fabrication gives you better control of the pace of your job, and keeps the job on schedule.

ACCURACY MAINTAINED— The IRONMASTER'S accurate and automatic angle-of-bend adjustment assures precision fabrication of all your re-bar requirements.

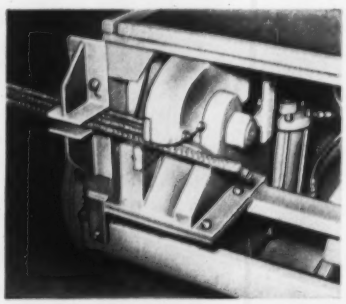
COSTS LOWERED — The IRONMASTER reduces re-bar handling time and expense, and eliminates long hours of back-breaking hand bending. It is low in original cost, and job-proven to be low in maintenance cost.

- available with gasoline or electric power in portable or stationary models.

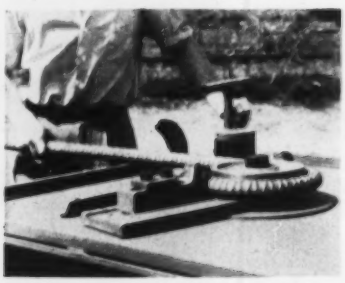
• *write for free bulletin No. A 56*



MULTIPLE BENDING



MULTIPLE SHEARING



HOOK BENDING NO. 11 BAR

IRONMASTER
MIDLAND PRODUCTS COMPANY
MIDLAND PARK, N. J., U.S.A.

. . . Reader Comment

price is a factor in competing for engineering engagements," whereas "the present code makes it appear that any competition involving price is unethical."

While I recognize the possible ambiguity of the present clause 4 the proposed change appears to me so futile that it will only aggravate a bad situation. I have always interpreted the phrase "competitive bidding on a price basis", which is forbidden by the present code, to mean open competition of the type employed in construction contracting, where sealed bids are invited, price is admittedly the prime consideration, and contracts are awarded to the "lowest qualified bidder". Apparently this was the interpretation of the ASCE Board of Direction which, in 1954, expelled one member and suspended the membership of thirteen others for participating in open economic competition for engineering work on the South Carolina bridges.

The proposed revision forbids inviting proposals or stating a price in response to invitations "when there are reasonable grounds for believing that price will be the prime consideration in selection of the engineer." The phrase "reasonable grounds" makes the canon completely subjective and therefore unenforceable. Instead of distinguishing between ethical and unethical procedures of negotiating for engineering services it requires engineers to read the minds of their prospective clients to ascertain their motives in selecting an engineer—an awesome task even for a psychoanalyst.

To illustrate the futility of such a requirement I ask this question: Can anyone imagine an engineer who might have "reasonable grounds" for believing that price is the foremost concern of all his clients voluntarily going out of business in order to comply with the new ASCE code?

C. W. GRIFFIN
Erlton, N. J.

CALENDAR

American Concrete Institute, annual convention, Bellevue-Stratford Hotel, Philadelphia, Pa., Feb. 20-23.

American Concrete Pipe Association, annual convention, Broadmoor Hotel, Colorado Springs, Colo., March 6-10.

American Railway Engineering Association, annual convention, Palmer House, Chicago, March 12-15.

Fifth Inter-American Sanitary Engineering Congress, Lima, Peru, March 19-25.

American Institute of Steel Construction, Eighth Annual National Engineering Conference, Lehigh University, Bethlehem, Pa., April 4-6.

Western Association State Highway Officials Conference, Phoenix, Ariz., April 10, 11, 12, 13.

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feeding
coarse crushing
screening
fine crushing
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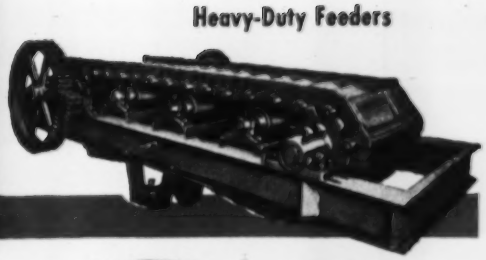
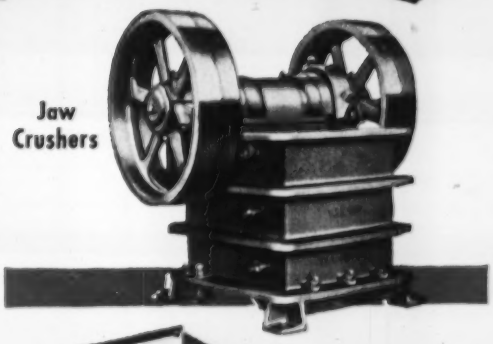
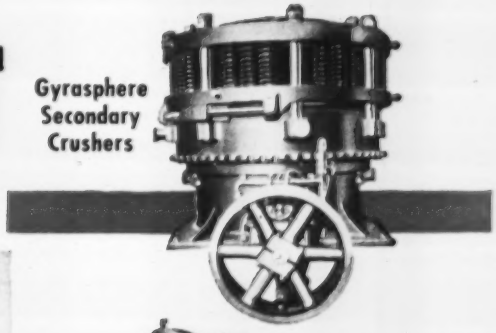
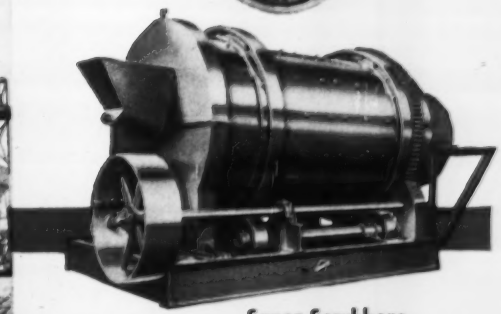
EQUIPMENT
FOR AGGREGATE


Heavy-Duty Feeders


Jaw Crushers

Vibrating Screens


Gyrasphere Secondary Crushers


Super-Scrubbers

E-16

SMITH ENGINEERING WORKS

500 E. CAPITOL DRIVE — MILWAUKEE 1, WISCONSIN

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Typical trench depth on $1,000,000 sewer excavation job by Geo. Sheaf & Company. Le Roi air power and Le Roi-Cleveland air tools were used to drill through rock.

Le Roi-Cleveland PL30 Drill Rigs, hung from crane boom, cut production time in half on the rock drilling project by Geo. Sheaf & Company near Tiffin, Ohio. Le Roi 600-cfm portable air compressors, and a self-propelled, 125-cfm Le Roi Tractair provided air power.

Rock-Drill Rig on Sewer Job Speeds Production 50%

Contractor uses Le Roi-Cleveland Air Tools to shoot and pull rock, often 18 feet deep, with one drilling.

The right air tools made quite a difference on a $1,000,000 sewer excavation near Tiffin, Ohio. Joseph Parker, General Superintendent of Geo. Sheaf & Company, Columbus, Ohio, states, "In nearly seven months of service in hard limestone, our Le Roi compressors and Le Roi-Cleveland Rock Drills had no down time, while in continuous operation 8 to 16 hours per day. They have performed to our utmost satisfaction. By using Le Roi-Cleveland PL30 Drill Rigs, we lowered our drilling costs and speeded production by 50 per cent."

Flexibility of special drill rig was a major factor in job speed-up. The Le Roi-Cleveland PL30 Drill Rigs provided unusual flexibility and ease of operation. This specially-designed rig, developed for rock work on pipeline projects, allowed the contractor to obtain proper drilling patterns for safe blasting in residential areas. Thus he cut construction time in half because he could shoot and pull the rock with only one drilling.

The Contractor standardized on Le Roi-Cleveland Air Tools using two PL30 Drill Rigs, two Model 52 Breakers, and two H10B Sinker Drills, plus hose, drill steel, and rock drill bits.

Le Roi air power helped speed up this project. Two Le Roi 600-cfm portable air compressors, and one self-propelled Le Roi Tractair (a combination 42-hp. wheel tractor and 125-cfm air compressor) were used.

This combination of Le Roi air power and Le Roi-Cleveland air tools gave the contractor exceptional drilling economies, including manpower savings, less upkeep, and more footage per shift.

Le Roi Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufactures portable and stationary air compressors, heavy-duty industrial engines, the Tractair and air tools. Write today for information about any of these products.

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Draglines on the excavator above, used in coal stripping operations at the Kingston Mining Company, Plymouth, Pa., get really rough service. The best Improved Plow Steel lines formerly lasted only 700 hours.

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"The complete dependability of your reinforcing steel deliveries is an important factor." Contractors who have completed jobs on or ahead of schedule tell us this repeatedly. They have found that our unequalled re-bar stocks and service facilities enable us to meet any schedule – without fail – make it easy for us to step up deliveries when job requirements change. Ryerson re-bars are accurately cut and bent; permanently identified for easy placement. On your next contract, let us quote our lump sum or average pound price, so you can find out for yourself about dependable Ryerson re-bar service.
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ENGINEERING NEWS-RECORD

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CONTENTS

NATIONAL AFFAIRS

AGC Annual Meeting 21
Monorail Rail Pilot Line 23
Engineer Chief Tours Flood Area 23
Oklahoma Restudies Price Plans 23
ASCE Hears Texas' Problems 24
Filling Starts at Buford's Reservoir 25
Local Floods Provide Disaster Plan 26
Los Angeles: Belt Conveyors for Transit? 28
Cement Outlook for 1956 30
Second Legal Test for Washington Toll Road 31

FEATURES

Water for the Booming Suburbs 33
Kansas Turnpike Is on the Move 36
Seabees Build Navy Housing Overseas 45

NEW PRODUCTS

Shelves for Builders 51
Enlarging Unit Converts Film to Drawing in 4 Sec. 51
Hydraulic Sewer Valve Sized Up to 12 in 51
Additive Makes Kerosene a Cheap Form Lubricant 52
Corrosion-Resistant Paint Applied to Wet Metal . 52
Pocket-Sized Dredge for Canal Work 52
Publications 54

INTERNATIONAL

World's Longest Cable Spans 12,000 ft 56
Argentine-Uruguary Project Revived 56

MEN AND JOBS

New President for AICE 57
Officer for F. H. McGraw & Company 59
Vice President for Rust Engineering 59

BUSINESS AND FINANCE

The Longer Look—Long-Term Investment Funds ... 79
City Fights Bid Error Ruling 80

LABOR

AGC Takes a Look at Labor Problems 84

Reader Comment 8
Calendar 12
Washington Observer 19
Obituaries 12
Editorials 96
Unit Prices 72
Materials Prices 74
Construction Scoreboard 76
Activity This Week 76

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THE CONSTRUCTION WEEK

AIA TO EYE CONTRACT FORM—Next week in Washington, the full 17-man board of directors of the American Institute of Architects will marshal their part of criticism of the government's standard public Housing Contract form. The AIA particularly dislikes the punitive clauses in Section 38—this section says that if any loss occurs on the jobs as the result of the architect's negligence, he must repay the federal government. Clauses of this kind, AIA says, are fair enough if they are written in the ordinary way, permitting the architect to have recourse to the courts. But Section 38, as now written, can be interpreted and enforced without recourse anytime a Public Housing Authority attorney decides against an architect.

EGYPT WILL ASK BIDS—Out of negotiations with the World Bank for a $200 million loan (ENR Feb. 16, p. 37) has come a change of heart and an announcement that Premier Nasser will ask bids for construction of the mammoth Aswan High Dam instead of negotiating a contract, as had been his original intent. Presumably this opens the door to interested U. S. contractors, but there is some awfully stiff European competition to be dealt with inside.

MORE FUEL FOR THE FIRE—Heavy construction contracts are setting a blistering pace. Last week, awards added up to an impressive $440 million to drive the eight-week total for '56 to a record $3,374 million. This is a roaring 42% above the year-ago volume and 30% more than the previous dollar record for this period, posted in 1953. Both housing and industrial building are going strong.

THE NAME'S THE SAME—For two years a group of historical societies has campaigned to have the New York Thruway's long bridge between Tarrytown and Nyack named in honor of the state's first governor, George Clinton. Last week the battle was over and the societies could start looking for another bridge. The State Assembly had voted 143 to 2 to call the span the Tappan Zee Bridge—the name it has held for most of the years it was being designed and was under construction.

BACK PAT FOR ENGINEERS—President Eisenhower took note of the need for engineers in a letter written in recognition of the fact that Feb. 19-25 is Engineers Week. The President's letter was a tribute to the engineering profession, addressed to Allison C. Neff, president of the National Society of Professional Engineers. NSPE sponsors Engineers Week each year the week of Washington's birthday.

End earth-mover tube and flap troubles!

All earth-mover and grader types, Wide-Base or Regular — at same prices as Conventional Tires with tubes!

Latest Goodyear "Firsts"—

TUBELESS TIRES Built with 3-T NYLON CORD plus EASY-MOUNTING TRU-SEAL RIMS

eliminate major causes of down time on all earth-mover and grader vehicles!

If you're wondering whether giant-size tubeless tires can be safely mounted—whether they really *hold* air—whether their savings in cash, time and trouble make them worth-while—GOODYEAR HAS THE PROVED ANSWERS!

Proof one – on actual commercial operations and construction jobs of all kinds, no serious tire or rim trouble has been reported!

Proof galore—unconditionally enthusiastic reports from independent operators add up to this:

NO MORE EXPENSIVE DOWN TIME because of tube and flap trouble!

NO MORE EXPENSIVE TUBE REPLACEMENT – a big factor on many jobs where tires outlast 2 or 3 tubes!

FASTER, EASIER MOUNTING AND DISMOUNTING—no more double inflation, no more tubes and flaps to handle —NO complicated mounting methods to learn!

TRULY AIRTIGHT ASSEMBLY—Goodyear's exclusive 3-T NYLON CORD forms an airtight chamber—and Tru-Seal rims *hermetically seal* the assembly!

COOLER RUNNING than conventional assemblies—means greater safety, longer tire life!

SLOW LEAKS INSTEAD OF BLOWOUTS—small, unnoticed injuries lead to blowouts in conventional tires. In Goodyear tubeless earth-mover tires, they may be detected and repaired *before* costly, dangerous damage!

SIMPLER, RE-USABLE VALVE-PARTS – Goodyear's tubeless valve program means fewer parts to stock, lower cost parts that can be used over and over again!

Leading equipment manufacturers are going Goodyear tubeless—with Tru-Seal rims. Specify them in the new wide-base or conventional cross sections and say goodbye to tube and flap troubles forever!

Goodyear, Truck Tire Dept., Akron 16, Ohio.

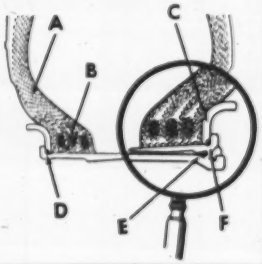
How Goodyear Engineering assures Quick, Airtight, Tubeless Assemblies:

(A) 3-T NYLON CORD plies prevent air-seepage through tire.

(B) Same 5° taper bead-base hugs Tru-Seal rim.

(C) Tru-Seal rim employs same general mounting principles as conventional rims.

(D, E, F) Tru-Seal rubber rings press into locking grooves, hermetically seal entire assembly—*automatically!*



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Look for this sign; there's a Goodyear dealer near you.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND!

Tru-Seal – T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

WASHINGTON OBSERVER

A decision on the Upper Colorado Project will come next week—according to present schedule. The House is expected to begin debate on Tuesday, and finally vote within the week. The outcome is uncertain.

Proponents have been getting more optimistic. Their main hope for a fairly comfortable passage is based on the fact that the Echo Park Dam—caught in a conflict over the threat to the Dinosaur National Monument—has been dropped and so militant opposition of conservationists has been dying, with that single point of dispute settled.

Eisenhower's concerted support for the multi-million plan is counted on, too. The Colorado plan, and the companion Fryingpan-Arkansas Project, are the Administration's chief federal public works programs in this election year. So support from Administration leaders in the House is counted on.

•

But opponents are now less pessimistic. They argue their forces are much broader than just southern California water groups, and eastern economy-minded congressmen. They say dropping Echo Park hurt their cause, but they've picked up heretofore uncounted support.

Southern and midwestern farm groups are claimed. The argument here is that the farmers, already confronted with a new farm law that will take acreage out of production, don't want new lands coming into production by way of irrigation in the West. Opponents boast they will pick up considerable number of farm votes.

Anger over Eisenhower's veto of the natural gas bill is counted on to gain votes from oil states Democrats in the House. There is no doubt that Speaker Rayburn and other southwestern states members are indignant at Eisenhower, and there may be some dragging of feet on Upper Colorado—just to thwart the President's big recommendation.

•

Early construction of any new atomic reactors is in for delay unless the problem of insurance protection is solved. The biggest insurance companies believe they can offer insurance up to $60 million of public liability, and $50 million damages for each plant. But utilities leaders testifying before the joint Congressional Atomic Energy Committee say this isn't enough.

Commonwealth Edison Co. of Chicago says its contract with GE to build a reactor near Chicago hinges on getting better protection than that being discussed.

Officials of the new 12-utility Yankee Atomic Electric Co. say they won't go through with their new plan—just approved by AEC—unless they get better protection.

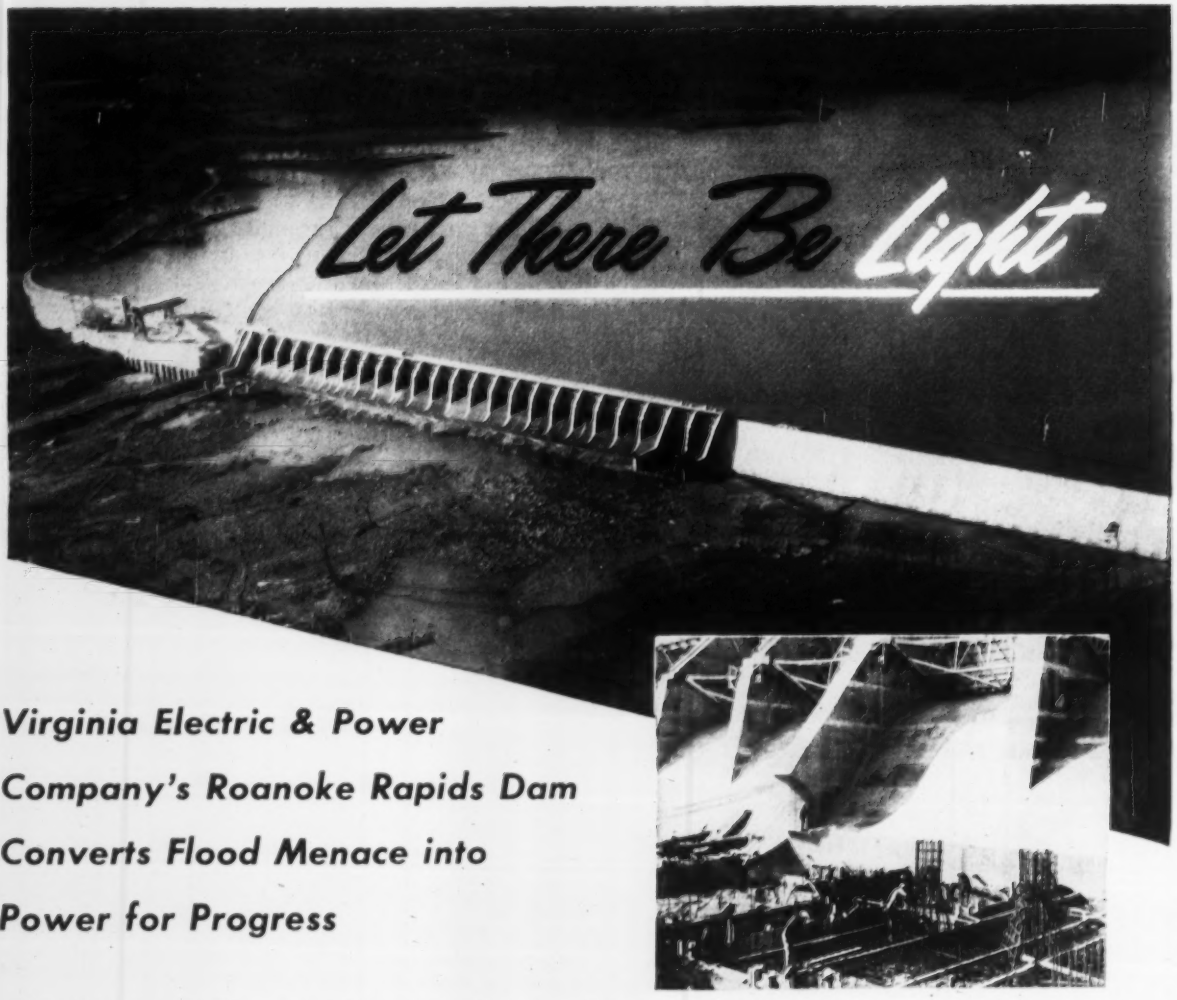
Some kind of government-aided insurance scheme may be the result. The government and most of industry had wanted to avoid this.

•

Tennessee Valley Authority is going ahead with expansion in advance of Congressional action on the Administration proposal to put new projects under bond financing. Preliminary work is going on for new steam plant capacity at Sevier and at Johnsonville. TVA is committing money it receives in power sales to negotiate for the additions. The Administration is asking Congressional approval of money to guarantee the expansion while Congress considers the bond financing proposal.

•

Loosening of housing restrictions is beginning to take effect. The Veterans Administration reports that requests for appraisals jumped 18% in January. This is a direct result of the renewing of 30-year mortgages on VA housing. Though appraisal requests totaled 29,284 in January—up from 24,892 in December—they fell far short of last year's January total of 46,204.



Virginia Electric & Power Company's Roanoke Rapids Dam Converts Flood Menace into Power for Progress

• Roanoke Rapids Dam, recently completed at a cost of $34 million, is at once a tribute to engineering and construction know-how and to American free enterprise.

Harnessing the Roanoke River, near Roanoke Rapids, N. C., this dam, 3,050 ft. in length and providing a maximum net head of 81 ft., creates a great productive resource out of a meandering stream with its threat of seasonal flood. The hydro unit's four generators produce 100,000 kilowatts, more capacity than is required by a city of 200,000.

A total of 264,500 bbls. of Lone Star Cement was used in this project, and the clean, attractive appearance of the tremendous expanses of concrete symbolizes the quality of construction throughout—an enduring and productive monument to the spirit of free enterprise, pace-setter of American progress.

HYDRO DEVELOPMENT, ROANOKE RAPIDS, N. C.

Owner
VIRGINIA ELECTRIC AND POWER COMPANY
Principal Office—Richmond, Virginia

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 38,000,000 BARRELS ANNUAL CAPACITY

Annual AGC meeting takes a look at . . .

Laws, Labor and the Business Outlook

Legislation, labor and the state of health of the business—in that order—were the dominant themes of the Associated General Contractors' 37th annual meeting in New York last week.

The legislation was that pertaining to a much-expanded federal-aid highway program and the now-perennial move for separation of specialty bids on government construction. Labor worries ranged from obtaining long-term contracts and lack of apprentices to applications of federal labor laws to construction.

• **Concerted effort**—Of special significance to many observers was the obvious effort at the meeting to get concerted action on legislative matters—not a common thing for an organization which specially divides itself into three major categories (highways, building and heavy construction) in order to conduct its normal business affairs.

But it was obvious—both at the meeting of the Highway Division, itself, and at other division meetings and in the corridors—that most of those present had convinced themselves of the importance of getting federal highway legislation through Congress this year. Speakers from the platform and from the floor in forum sessions drove home the point that any large-scale highway program must benefit all segments of the industry, either by direct work in highway construction, or induced construction of manufacturing and commercial establishments attracted by improved communications.

The contractors didn't go on record as to how a highway program may be financed. What they were primarily interested in was getting a program through.

And—most unusual—all three divisions drew up resolutions of mutual support that were in favor of a highway bill.

• **Bid shopping**—The situation was much the same on the somewhat more complex—and, for the moment at least, more specialized—problem of separation of bids.

For the fourth successive year, specialty contractors are hard at work in Washington attempting to put through a measure to end the practice of "bid-shopping," wherein general contractors are accused of squeezing the subcontractors in order to fatten their own profits or to compensate for their own too-low bids.

From the viewpoint of the general contractors, a particular threat now exists in that the Senate passed a bill partially in line with the specialty contractors' wishes near the end of last year's session, and that bill—S 1644—is now up for action in the House. That's a lot closer to success than any other proposal has gotten so far.

As now worded, S 1644 is much modified from earlier versions requiring simply that the general contractor name his intended subs when he submits his own bid, and employ those subs if his bid is successful. (That provision, incidentally, is almost an exact copy of AGC's own recommendations to its members in their own dealings with subs.) But the general contractors look on the measure as a "foot-in-the-door" bill, that, if passed, will inevitably pave the way for further restrictions.

John Volpe, Boston contractor and recently Massachusetts Commissioner of Public Works, commented that his state has such laws now—started with "name the subs" and now including bid depositories and other restrictions.

The generals oppose any separation moves on the ground that they are by definition professional managers of construction projects, and that by permitting a general to handle the whole job, make his own deals with the subs, the owner can save money, get better work.

As in the case of highway legislation, all three divisions joined in resolutions to oppose S 1644, and work personally for its defeat.

• **Labor: Who's worried?**—On the question of labor relations and wage

. . . And the Air Force dropped a bomb

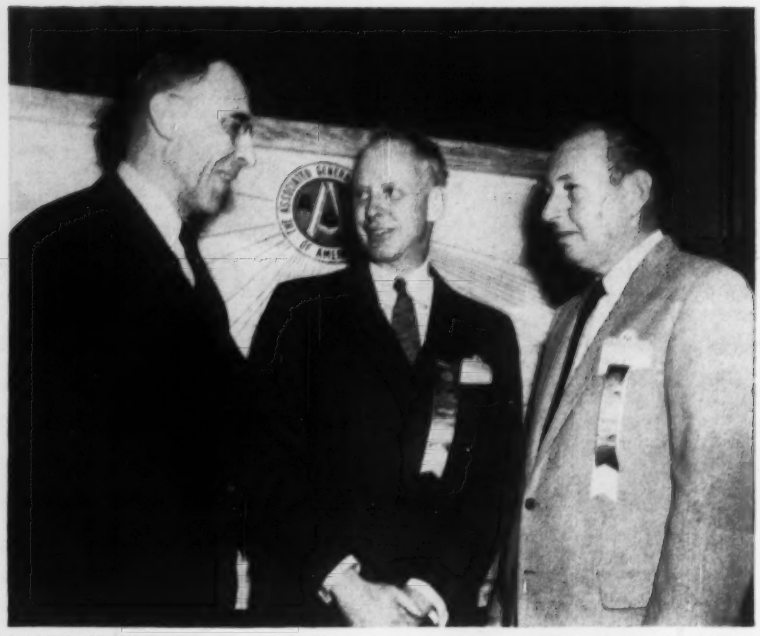
Some interesting sidelights of AGC sessions stressed the Air Force's apparent determination not to use flexible-type pavements for its runways.

At a meeting of the Heavy Construction Division, Col. R. R. Conner, Air Force director of construction, stated: "From now on, in general, we will be building in portland cement concrete, with slabs 20 in. thick or thicker, and with higher smoothness tolerances."

Two other military construction leaders—addressing a general session—undertook to explain reasons for the extremely close smoothness tolerances the Corps has been demanding in Air Force construction.

Said Lt. Gen. S. D. Sturgis, Jr., Chief of Engineers: "Many of our aircraft are so constructed that the crew sits far forward of the landing gear. On a "'hot' landing, every dip and bump of the runway surface is magnified into a rocking motion of the plane at the very instant when the pilot needs maximum control. . . . Unevenness in runways can mean the repeated loss of valuable equipment and priceless lives. . . . The establishment of longitudinal and transverse gradients for finished airfield pavements are not alone sufficient. . . . It has become necessary to exercise closer control during construction. . . ."

Commented Maj. Gen. Lee B. Washbourne, Assistant Chief of Staff, Installations, for the Air Force: "When the Air Force began to operate jet-propelled aircraft about four years ago, it was immediately apparent that operational problems would result from . . . extremely heavy aircraft weights on high pressure tires. . . . I will not dwell on certain shortcomings of flexible pavements that have been demonstrated. . . . With appropriate exceptions, it is the Air Force conclusion that (portland cement) concrete can 'take it' and 'black top' can't. . . . Our present policy is that the primary-use areas involving combat aircraft . . . are to be built of portland cement concrete."



GAVEL WIELDERS—George C. Koss (center) retiring president of Associated General Contractors, confers with Frank J. Rooney of Miami (right), who succeeded him in AGC's top office; and Lester C. Rogers, president of Bates and Rogers Corp., Chicago, new vice president.

. . . AGC's annual meeting

demands, the contractors didn't seem greatly worried. They were certain that labor would demand—and would get—some further raises and some minor changes in working conditions, but thought the industry could handle the situation without too much trouble when it comes along (see page 84).

They heard high praise—from their own members and from T. C. Kammholz, general counsel for NLRB—for the workings of their own National Joint Board for the Settlement of Jurisdictional Disputes. And no one concerned seemed to think there would be any serious hitch when the present employer-union agreements setting up the Joint Board come up for renewal March 31.

Rather, the builders turned their eyes to two other matters—how to get longer-term agreements with labor; and what to do about the discouragingly low number of apprentices at the present time.

Obviously, two-year or longer wage and working condition agreements are to the advantage of the industry because they made for stable bidding conditions. The worry is how much must employers "pay" labor—in terms of concessions—to obtain such contracts. After several days of discussions, both in open and closed sessions, the consensus was that the price needn't be too high.

On apprentices, the picture is admittedly bad, and there's room for honest worry about supplying enough trained manpower to replace workers who die, retire or leave the industry. No one seems to know exactly how many apprentices are actually in training at the moment—one figure given at the meeting was 96,000—but most seem to agree that about 200,000 young men should be in training at all times.

One remedy was proposed by AGC's apprenticeship committee: the establishment of a full-fledged Apprenticeship Department within AGC's Washington headquarters. The proposal is under study.

Paradoxically, it developed in discussion that the federal officials—by reading procedures too closely—may themselves be obstructing the apprentice programs. Contractor after contractor complained of expensive, time-consuming delays caused by changing the status of an apprentice after he goes to work; and of provisions in many government contracts providing that such expenses and delays shall be absorbed by the contractor, even though occasioned by action of a government department.

Further, the discussions brought out general opposition to any extension of federal wage-setting powers—most preferred they remain on a state level. A future Labor Secretary might upset the highway program, it was pointed out, by a different interpretation of wage laws.

• **Patient doing fine**—As to the state of the construction business' health, there was general agreement:

Very good. Some sore muscles here and there, but these are only minor annoyances.

Never has there been so much business being done, never so much in prospect. Only thing worrying most contractors seems to be the margin of profit—which they think is too low, under the pressure of continuing intense competition.

The competition, they think, stems from a general upgrading of the firms that stay in business: Little firms get bigger; bigger firms get bigger yet—and driven by this growth, they tend to shave their profits to keep their organizations intact so as to be ready to handle the really big job when it comes along.

One contractor even had something good to say about the bid-shopping legislation. He thought passage of such legislation might "put the general contractor back into the construction business"—make it cheaper for the general to do all phases of the work himself, rather than wrestle with uncontrollable subs.

• **Big names**—In their four days of meetings, the contractors heard from such top industry figures as Rear Adm. R. H. Meade, Chief of the Navy's Bureau of Yards and Docks; Maurice Hutcheson, head of the carpenters' union; W. A. Dexheimer, Commissioner of Reclamation and others.

They also elected new national officers (see accompanying photo) and new officers for each of the three divisions.

Junior-Senior High School Sprawls Over Eight Acres

Ground will be broken on March 1 for a $7-million junior-senior high school at Great Neck, N. Y. Total cost will be $9,205,000, including site improvements, equipment and swimming pool. Completion is expected by Sept. 1957.

Located on a 115-acre site, the school will consist of two groups of one- and two-story buildings arranged in an arc-like pattern. The junior and senior high sections will be separate units, interconnected by covered corridors leading to a central, circular cafeteria building. Buildings will occupy about eight acres.

Design is by New York City architects, LaPierre, Litchfield & Partners. The general contractor is Psaty & Fuhrman, also of New York.

Monorail Test

970-ft-long pilot line is demonstrated in Houston

A 970-ft pilot test monorail line was demonstrated last week in Houston, Tex., to U. S. and Canadian transit officials.

The test installation is the type that Monorail, Inc., plans to fabricate and build, for lease or sale to transit companies or authorities.

The aerial coach—seating 60 passengers—is said to be a radical departure in design and operation, according to Monorail President Murel Goodell. Its construction makes use of what Goodell calls "concentric suspension" and consists primarily of a series of suspended concentric steel rings braced by a unique arrangement of longitudinal steel stringers.

The oval-shaped coach is capable of 100 mph with its present power—two 305-hp internal combustion gasoline engines. However, diesel or electric motors can be used. And rails and towers have been designed so that the coach—with suitable power—can travel at a much greater top speed.

Eighteen 30-ft high inverted J-shaped steel towers with bell bottoms support the rail beam. These cylindrical towers are spaced 55 ft center to center.

There is an 18-ft clearance above the ground. One end of the rail slopes down so that the coach can rest on the ground while taking on passengers.

The steel-ribbed coach, which weighs 26,700 lb, is 54 ft long, 8 ft wide and has an inside height of 7 ft. It is almost completely covered with a skin of reinforced polyester resin. The remaining 25% or so of the surface is glazed with tinted translucent plastic.

The coach is equipped with automatic electric brakes and couplings, and features a 7-ton air conditioning system. The brakes, especially adapted by the designers, are the same type as those used on heavy trucks. Mechanical brakes have been added for emergency use.

The engineer-operator, sitting in a dome on top of the coach, is able to see the entire track area. The coach is operated much like an automobile, but uses only two gear shifts instead of four or five. It has eight pneumatic rubber tires that lock on the rails. On top of the rail is a locking guide rail. If there should be a blowout, one of the eight auxiliary wheels takes hold.

Monorail President Goodell—a Houston engineer experienced in construction of industrial monorail systems—worked out foundation and tower design along with two other engineers, Francis J. Niven and Weldon F. Appelt.

Supervising contractor and testing engineer is Felix A. Davis, of Felix A. Davis Construction Co.

State Adopts Third Code

The New York State Building Code Commission announced this week that its newest building code—applicable to commercial, industrial, institutional and other non-residential building construction—will go into effect on May 1.

The new code complements two others previously promulgated for residential construction.

To adopt the codes, local legislatures must pass a resolution accepting their applicability.

In addition to the building regulations, which generally are of the performance-standards type, the commission makes available a manual detailing typical permissive methods of meeting code requirements.

Oklahoma Makes a Last Ditch Stand to Save 'Pike System

Shaken by engineering reports that cast doubt on the financial possibilities of part of its planned turnpike system, Oklahoma this week was engaged in what it admitted was an "all or nothing" restudy of its toll road plans.

The initial shock was delivered to the state turnpike authority on Feb. 7 by Wilbur Smith, New Haven, Conn., traffic consultant, who told the agency that a northern turnpike route between Oklahoma City and Wichita, Kansas probably would not pay off. This route is one of three authorized for the state—two others would stretch southwest toward Wichita Falls, Texas and southeast to Tulsa and include connections with Dallas and Fort Worth.

In making his report, Smith said that his surveys and estimates of revenue on the northern leg didn't come up to figures produced by another engineering firm in surveying the same route some years ago. Even that earlier and more optimistic report, incidentally, evoked no great enthusiasm on the part of financial interests at the time.

In an attempt to save the whole turnpike plan, the authority ordered Smith under a new contract to recheck his figures, particularly to see if revenues from the two southern roads would carry them and the northern extension as well. Meanwhile, the state also entered into a contract with DeLeuw, Cather & Co., to study most feasible routes and costs for the four to Dallas

Flood Picture

Engineer Chief airs views after tour of flood area

Lieut. Gen. Samuel D. Sturgis, Jr., Chief of the Corps of Engineers, made some thought-provoking statements after a swift tour of California's flood damaged areas. They served to answer recent requests for federal flood-control projects (ENR Feb. 16, p. 44).

He recommended a practical and reasonable approach to the flood-control problem rather than the advancement of proposed new plans and new authorizations which would "confuse" and "kick over" advancements already on the drawing boards. He pointed out that the Corps already has authorization for projects which would provide protection for much of the area flooded in late December.

The general said the Corps is in a position to start at once on Success Dam on the Tule River. Plans, he noted, are completed for this $13-million project and engineering studies are far enough advanced on the $17-million Terminus Dam on the Kaweah River to get work started very soon.

He also listed for early construction the $53-million New Melones Dam on the Stanislaus River; $15.8-million Hogan Dam on the Calaveras River and the $15.5-million Black Butte Dam on Stony Creek.

All these projects were authorized in the 1944 Flood Control Act.

"It is only common sense to go ahead with these works," Gen. Sturgis commented. "Let's not get confused with new plans and new authorizations."

Gen. Sturgis said the Corps will look into the Feather River levee problem. He noted the levees are closer to the river than those in any other part of the nation. This, he said, is a severe handicap to overcome and it may require costly riprapping or moving back of the levees. Two levee breaks on the Feather River caused a huge part of the overall $200-million statewide flood damage.

We'll Always Need Horses

Not all horsepower at Chief Joseph Dam on the Columbia River near Wenatchee, Wash., is in the generators.

To stop flow through supposedly sealed future penstocks, George Piedmont, projection manager for Columbia River Constructors, ordered 100 tons of horse manure from nearby ranches. The manure was dumped into the water and allowed to filter into the joints. The material substantially curbed the leakage where other devices had failed.

Booming Texas parades its problems as . . .

ASCE Meets in Dallas

There were papers of general engineering interest on the program of the winter meeting of the American Society of Civil Engineers in Dallas last week, but they were overshadowed by those that were focused on the problems of the booming Texas cities and countryside. This Texas flavor was further accentuated by the social events and inspection trips arranged by the hosts, the society's Texas Section, under J. W. Porter, president, and Prof. I. W. Santry, general chairman, on which the basis for many of the tall tales for which Texans are noted was quite definitely established.

Gov. Allan Shivers at a special luncheon gave further credence to Texas accomplishments. He noted that since 1946, the highway budget has increased from $38 million to $192 million annually, and the education budget from $84 million to $300 million. There is a $1.4-billion, 10-year main trunk highway program under way, and 43,530 school classrooms must be built in the next five years. In the vital water supply field, the recent legislature set up a Water Resources Committee which has proposed some $300 million of projects.

• **Water for Dallas**—Spurred by its rapid growth and the specter of inadequate water, Dallas ordered a long-range survey of sources. James A. Cotton of the Dallas consulting firm of Forrest and Cotton, who made the survey, reported that the necessary additional surface supply (321 mgd by the year 2000) can be obtained by building two more reservoirs on Elm Fork and one on the Sabine River. Dallas' present surface supply of 164 mgd comes from the Elm and East Forks of the Trinity River. It also gets about 80 mgd from wells, but this supply cannot safely be increased.

In another paper, by Mr. Cotton and William E. Wood of the Fort Worth District, Corps of Engineers, flood-control reservoirs in the Trinity River Basin were also urged. Four reservoirs and two floodways have been proposed at a cost of $75,100,000 of which the federal government would provide $62,300,000. One overflow of the urban areas of Dallas and Fort Worth, the authors said, would result in flood losses in excess of the total cost of the project. Rural lands would also be benefited. Also storage space for water supply in the proposed reservoirs would furnish a dependable source of 217 mgd.

• **Houston flood protection**—Rectification of natural channels to improve them as floodways is the most desirable and economical way to afford flood protection to Houston, according to Kenneth Heagy, Chief, Engineering Division, Galveston District Corps of Engineers. The principal streams passing through the city are Buffalo Bayou and its tributaries, Brays and White Oak Bayous. Straightening, enlarging and lining these channels is what is needed. Diversion is not practicable because of the growth of the city, and sufficient retention is now provided by the existing Barker and Addicks Reservoirs on Buffalo Bayou which control the runoff from 57% of the area draining into the Houston Ship Canal.

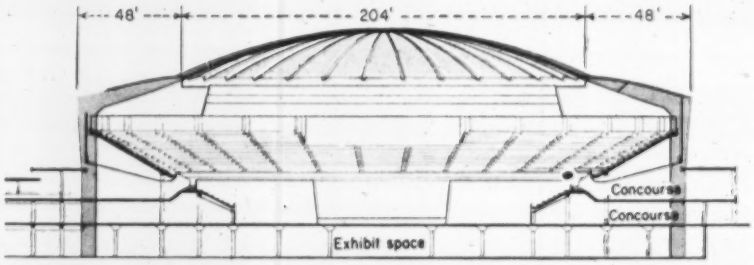
• **Better port for Corpus Christi**—In 1926 the first ocean-going vessel entered the Port of Corpus Christi, which now is said to rank ninth in the nation. Further growth, however, was pretty well checked by a narrow harbor entrance crossed by a combination rail-highway bascule bridge. This bottleneck is now being removed by the replacement of the bascule with a high-level bridge, widening the entrance to 400 ft and the construction of a combined rail-highway vertical lift bridge across the harbor 3½ mi inland from the entrance. The high-level bridge, an $8-million project, is notable for the width of its deck, 82 ft, and its 235 ft maximum height above the water.

• **Power and water**—Two interrelated Texas problems—demands for more power and need for more water—are being helped toward solution by the state's private utility companies. More and larger steam power plants introduce increasing requirements for condensing water, but pumping it from wells lowers the water table to dangerous levels. The utilities, therefore, are turning to storage reservoirs or cooling ponds of various types—on streams where possible, or off stream in cases where they can be pumped full from nearby water courses. Not only do such reservoirs give the utility necessary condensing water, but in several instances they are being shared with municipalities for water supply. And they conserve the groundwater.

M. G. Salzman, Ebasco Services, Inc., New York, described a number of these installations and the methods used to separate the cool water intakes from the hot water discharges. Dikes in the reservoirs sometimes separate the two, in other cases long discharge canals are used to get the hot water back to the far end of the reservoir. These canals, in this so-called extended recirculation layout, are sometimes quite long.

• **Sewage oxidation**—Texas sewage treatment leans toward oxidation ponds according to D. F. Smallhorst of the Texas Health Department. Of 800 treatment plants in Texas, some 200 have such ponds—100 of them in connection with irrigation projects. Mr. Smallhorst made these observations in discussing a paper on oxidation pond design prepared by Prof. Earnest F. Gloyna and Edward R. Hermann of the University of Texas. They noted that a treatment unit disposing wastes into a stream where appearance is not a factor can handle about 200 lb of biochemical oxygen demand per acre per day. Where effluent quality must be better, the rate should be reduced to about 50 lb BOD per acre per day. As to the ponds themselves, care must be taken to assure uniform flow characteristics—one requirement being that the first one-third of the length should not be deeper than 4 ft.

• **Radioactive wastes**—Total economic benefits to be realized from nuclear power generation may be limited by problems of disposal of radioactive wastes from the reactors, according to a paper by Conrad P. Straub of the



NEW DALLAS AUDITORIUM will be roofed with a unique concrete dome supported on cantilevers from the wall columns and providing a 300-ft-dia area free of columns

Oak Ridge National Laboratory. Investigations are being made of underground disposal, but definite conclusions have not yet been reached. Most promising possibility seems to be well injection such as is being used by the petroleum industry. But any underground disposal depends on the level of radioactivity of the wastes and the character of the ground formations. One of the most suitable formations seems to be salt deposits or domes. Up to now most of the wastes are being kept in underground tankage which costs from 30 cents to $2.00 a gallon for first cost, and in addition requires regular monitoring.

• **Bold auditorium**—The new Dallas Memorial Auditorium, now under construction, will feature a concrete dome made of articulated framing. Providing a 300-ft-dia clear floor space, the dome will be made up of 48 ft arms cantilevered from 70-ft-high columns around the circumference, the arms carrying a 204-ft dia dome. The roof is divided into 16 pie-shaped segments, each opposing pair of which forms a self-supporting arch unit. The pairs of segments will be built on traveling steel falsework with the exception of a center plate 22 ft in dia which will be cast on a fixed steel tower.

Boyd G. Anderson, associate partner of Ammann and Whitney, consulting engineers, New York, in telling of the design, credited the falsework with permitting this type of dome to be built for about one-half what either a true concrete dome or a steel framed dome would cost.

• **Tallest welded building**—A new record height, 30 stories, for an all-welded building has been set by the new Continental National Bank in Fort Worth, which thus tops the 24-story Bank of the Southwest Building in Houston also recently completed. According to Don W. Kirk, chief engineer for Preston M. Geren, Fort Worth architect, the top 26 floors of the building were erected in only 13 weeks. A contributing factor to this speed was a simplification of fabrication in which beam sizes and lengths were kept uniform for several stories by minor changes in column connections.

Four stories of the Continental National Bank Building had been built before the Korean war stopped construction. At that time it had been planned to be only 28 stories high, but substitution of lightweight concrete for floors and fireproofing, and the use of a metal skin exterior permitted the height to be extended to 30 stories. The building, 95x100 ft in plan, contains 11 lb of steel per sq ft of floor area and 6 lb of welding rods per ton of steel. Welding was controlled by visual inspection plus radiographs at random locations. The building was designed for a uniform wind load of 20 psf.

Filling Starts at Buford's Reservoir

Construction was climaxed early this month on $42-million Buford Dam near Atlanta, Ga., when the Corps of Engineers lowered the intake gates at the penstocks to begin filling an eventual 37,000-acre lake. Under construction since 1950 (ENR May 5, 1955, p. 34) the project will provide first power by December of this year. The main Buford Dam, on the Chattahoochee River, is an earth structure 1,630 ft long and 192 ft high. Satellite dikes totaling 5,000 ft in length were also required.

Downstream water requirements had been met, after closure, by releasing water through penstocks.

• **Pipelines and plastics**—Special emphasis was placed on oil and gas pipelines and on plastics as a newcomer to the field of engineering materials by devoting entire sessions to these subjects. In fact, pipelines occupied three sessions and a luncheon meeting as a part of a campaign to establish a separate technical division in the society for this field of engineering.

Pipeline paper themes ranged from economics through markets for products to submarine line construction, but the reasons why pipelines are claimed to deserve special attention were stated in talks by Rear Adm. L. B. Combs, CEC, USN (Retired) of Rensselaer Polytechnic Institute, and Stephen D. Bechtel, Jr., of Bechtel Corp. Adm. Combs pointed out that there are 500,000 mi of gas pipeline in the U. S. serving 25,000,000 homes, and that about 65% of the energy requirements of the country are now furnished by oil and natural gas brought in by pipeline. Mr. Bechtel said that pipeline construction is a billion-dollar a year enterprise, and that in 1955 some 15,000 mi of new lines were laid, with another 17,000 mi scheduled for this year. A typical gas pipeline, according to Mr. Bechtel, would be built at a mile a day rate, each mile representing a total installed cost of from $100,000 to $150,000.

The importance of plastics as an engineering material is growing rapidly. Prof. Albert G. H. Dietz told a special session devoted to this subject. Non-structural plastics are well known, but structural types are now being developed by the use of reinforcing in the form of high strength fibers embedded in resin binders. Some of these have been in use for 10 years, so the plastics industry is gradually gaining experience with them. C. Howard Adams, Monsanto Chemical Co., noted that reinforced plastics will develop up to 50,000 psi tensile strength, while most ordinary plastics won't exceed 10,000 psi. Whether plastics are the proper material for a given lightweight structural use will depend on a comparison of their strength-weight ratios with the ratios of other lightweight materials, Mr. Adams said.

Local Floods Provide Disaster Plan

Teamwork ideas that speeded restoration work by the Army Engineers and their contractor allies in the flood-battered Northeast after last August's rains will soon find application throughout the Corps' civil works organization.

Within the next few weeks, the Chief of Engineers, Lt. Gen. Samuel D. Sturgis, Jr., will set up a nationwide system of organized disaster units in the 10 divisions and 40 districts of the Corps. Staffing these standby units will be personnel selected from among the 50,000 people in the far-flung Engineer organization. Those chosen in each district will be specially trained to handle assigned functions when disaster strikes.

Built-in flexibility of the system and ready-to-go mobility of the units will enable them to operate in any part of the country. Disaster forces in any division will be on call for service in other regions, upon request from any division engineer who requires more trained units than his own organization can supply.

That, in a nutshell, is the disaster preparedness setup which will soon take shape as a result of what the Army Engineers learned in restoring flood-wrecked valleys following Hurricane Diane. Here is how that experience laid the groundwork for the nationwide system that will soon start functioning.

• **Northeast flood setup**—Operation Noah—as the Engineers called their Northeast cleanup and rebuilding mission—was a kind of assignment for the Corps. In the wake of Diane's devastating floods, they were called upon for the first time after a disaster to do these things: Clear debris and wreckage, make emergency repair or temporary replacement of public facilities, and perform on any lands—public or private-work necessary to preserve life and property.

Speed was the essence of the whole operation. Men, machines and materials had to move in fast to help 675 flood-hit cities, towns and localities get back on their feet. With full backing of federal, state and local authorities and the indispensable cooperation of contractors in the six affected states, the Engineers quickly got the big rehabilitation job rolling in high gear.

Red tape took a beating during the fast start. But that was all right with President Eisenhower. To his disaster proclamation on August 23, he had added a personal order: "Cut red tape: get rehabilitation rolling."

Despite the tape-slashing, the Engineers took no liberties with the law. The work was pushed, and pushed hard, on a strictly legal basis. But the Corps quickly adopted new ideas and shortcuts for signing up construction firms without formality of delay.

Last week in Washington, Col. William F. Powers, Assistant Chief of Civil Works for Operations, related what Operation Noah had taught the Corps that will be followed in future disaster operations. It was more or less a valedictory for Powers who over the week end left Washington for a new assignment. Powers was head of the operations center for the disaster area.

The first big step the Engineers took was to cut through normal procedures so that staff people could let any form of contract in the Army file, or issue a letter of intent whenever necessary to get a job going at once.

• **Adopt Navy contract form**—In addition, Powers and his chief quickly adopted for field use a short-form contract, covering two sides of a single letter-size sheet that the Navy's Bureau of Yards and Docks had employed for some time. This simplified document speeded contract signing for many jobs, particularly those costing less than $25,000.

Under this broad authority, field representatives could sign any standard type of contract: Cost-plus-fixed-fee, negotiated lumpsum or unit-price, or time and materials. Corps people also were empowered to do force account jobs if necessary, but contractors came through so promptly that day labor never had to be used.

In real emergencies, Corps representatives told the contractors to start and gave them contracts the following day. Or they backed up their oral work with a letter of intent that the contractor could use to establish credit with suppliers. Such a letter started the two-day placement of 25,000 cu yd of fill in bridge approaches at Putnam, Conn., to restore access to the town's only hospital.

Letters of intent, however, are not strictly contract documents. Hereafter, the Corps will use letter orders to do the same thing. A letter order constitutes a contract. Every Corps disaster unit will have a supply.

Wherever practicable, Corps people negotiated lump-sum or unit-price contracts. When possible, they invited bids from several contractors, but this couldn't be done in the early stages. Later, competitive bidding became feasible where adequate emergency alternates were functioning, and restoration of an outfall or sewer line, for example, could be deferred long enough to estimate the repair job.

Col. W. F. Powers

All Northeast restoration jobs were converted to firm contracts before work was completed. At the start, of course, it was impossible to define the scope of such jobs as removing debris and hazardous portions of damaged buildings. When the extent of the work could be defined, the rest of the job was negotiated on a lump-sum basis.

Sturgis and Powers quickly moved several hundred experienced flood fighters from other divisions into the flood areas to assist the New England and North Atlantic Divisions. The first wave included expert estimators and expediters, as well as field officers and civilian engineers who could take over at once. Some 20 area officers had been set up and were functioning on the first day of the operation. Later, more than 100 auditors were sent in to audit all contracts and assure the adequacy of the records.

• **No contractor claims**—In all, the Corps let 1,601 separate jobs—all of which ended up as lump-sum or unit-price contracts, including those converted from the time-and-materials type—and not a single claim or dispute has arisen from them.

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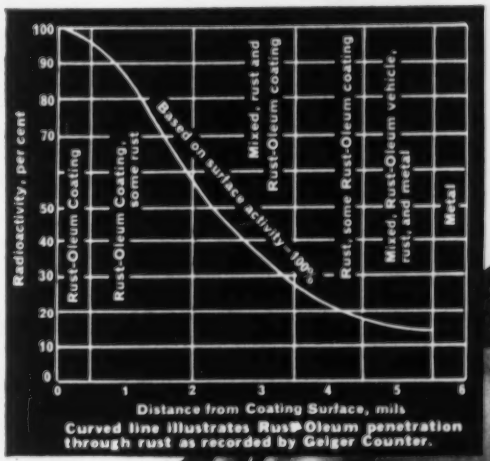

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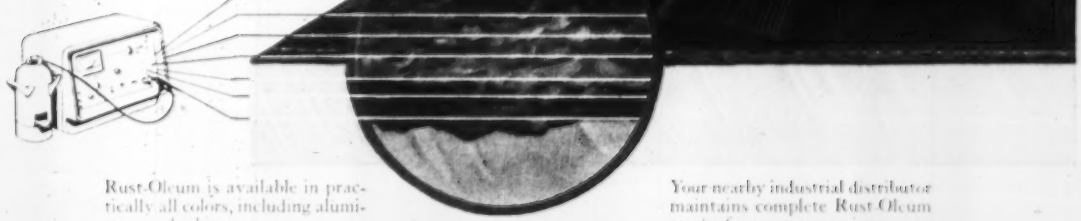

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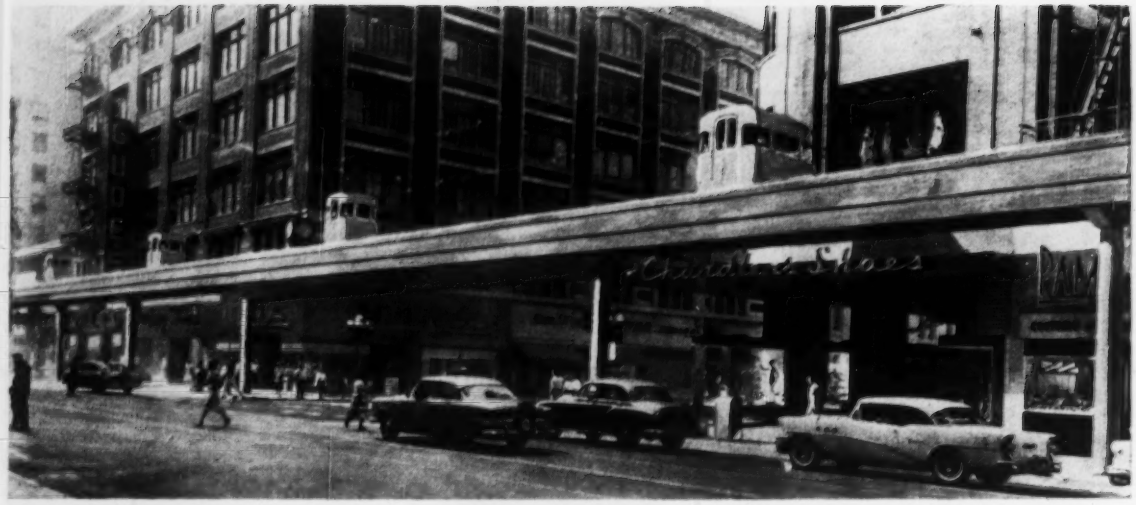


56,000 PASSENGERS PER HOUR could be carried by a series of small passenger cars running on overhead belt conveyors.

Belt Conveyors for Transit? Los Angeles Thinks it Over

Most novelties in mass transportation methods have been fine in science fiction settings but far ahead of practicality. Los Angeles found this out when it failed to get legislative action on a $165-million plan for monorail rapid transit. Now it's looking over a less ambitious scheme: a $35-million overhead belt-conveyor.

The system—a series of small passenger cars transported on belt conveyors—is the same type considered by the New York Transit Authority as a replacement for the Grand Central-Times Square shuttle train under 42nd St. (ENR, Nov. 11, 1954, p. 27). The major difference is that Los Angeles would apply the plan mainly on the second-story level.

The Los Angeles installation would be erected some 18 to 20 ft. above the sidewalk and have entrances and exits through stores and buildings. Cars would be 5 ft wide, 7 ft long and seat six people. They would move on a structure approximately 6 ft wide, which would be supported by single posts.

This is how the system would work. Passengers would board a loading belt moving at 1½ mph. From there they step into cars running at the same speed on a parallel conveyor belt. Cars move over rollers that speed them up to 15 mph and transfer them to a belt moving at the same speed. On approaching the next station, decelerating rollers slow cars back down to 1½ mph.

• **Suggested routes**—The 6-mi system proposed for Los Angeles has been drawn up to link the main shopping, hotel and business districts with the Civic Center, Union Station, transit terminal and peripheral parking areas adjoining freeways.

Four suggested transit routes, connected at points to permit transfer from one loop to another, would average 1½ mi in length and carry 14,000 passengers per hour.

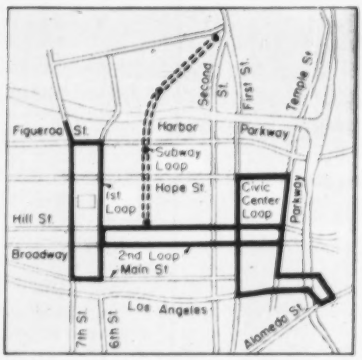
These are the four proposed routes:

• Loop No. 1 would run on 6th and 7st Sts. between the 6th and Main St. Terminal area and the Statler Hotel-Harbor Freeway area. Multi-deck parking facilities, constructed over or adjoining the freeways, could be linked with the loop by moving sidewalks.

• Loop No. 2 would run on Hill St. and Broadway between 6th St. and the Civic Center and Santa Ana freeway area.

• Loop No. 3, the Civic Center route, would fill intra-transit needs of city, county, state and federal buildings from Alameda St. to Figueroa St. on Bunker Hill. Extension of this loop to Union Station provides services to commuters.

• Loop No. 4 would use the now-abandoned subway between Hill St. and the junction of 2nd St. and Glendale Blvd. Stations on this loop would give access to the new commercial area to be occupied by the Chamber of Commerce Building and other large developments. It would also serve the proposed Civic County Auditorium and Bunker Hill area. A multi-deck garage could be provided at the Glendale Blvd. terminal.



FOUR LOOPS for six-mile system would link areas of greatest traffic flow.

• **Financing plan**—Financing usually poses a big question mark for any project. And that's what has blocked installation of the belt-conveyor system for New York's shuttle.

For Los Angeles, average cost of a single loop has been roughly estimated at about $8.8 million. Studies show that this capital expenditure could be amortized in 20 years. And the system would be self-supporting—even if it were operated at only 50% capacity—providing a 10-cent fare were charged. Under these conditions, the estimated yearly revenue from a single loop would be in excess of $2 million.

The system under study—officially known as the Carveyor System—is a joint product of Goodyear Tire & Rubber Co., Akron, Ohio, and Stephens-Adamson Manufacturing Co., Aurora, Ill., and Los Angeles. Application of the system to Los Angeles' needs was designed by Samuel E. Lunden, partner in Lunden, Hayward & O'Connor, Los Angeles consulting architects and engineers.

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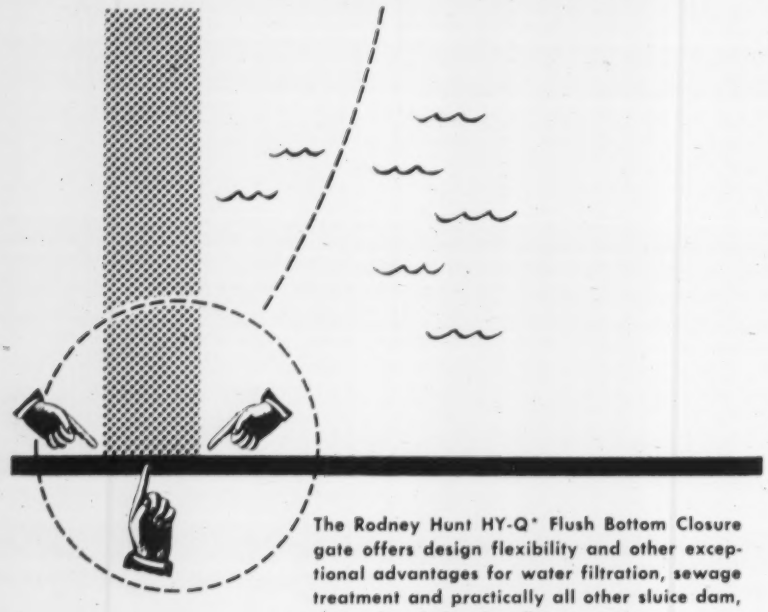

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Cement Outlook

Concrete producers weigh supply, demand for 1956

Ready-mixed concrete production can hit an all-time high this year. But the big question is: Will there be enough cement? That's one of the prime worries of both the concrete producer and the cement manufacturer.

The producers of ready-mixed concrete foresee a bigger market this year than ever before, but obviously, they must have more cement. And although the cement manufacturer knows that, collectively, the ready-mix producers are his biggest customer, facilities may be inadequate to supply sufficient cement again this year.

Both sides of this question of supply versus demand were explored in considerable detail at the National Ready Mixed Concrete Association's 26th annual meeting in Chicago last week—held in conjunction with the 40th annual convention of the National Sand and Gravel Association.

• **Big cement user**—Speaking as a producer of ready-mixed concrete, Herbert G. Jahncke, vice president, Jahncke Service, Inc., New Orleans, estimated that the 2,000 or more companies producing ready-mixed concrete used over 100,000,000 bbl of cement last year. This is roughly one-third the total cement production in this country during 1955, he said. By comparison, an ENR survey of the portland cement companies last fall indicated that the industry would have a total capacity of 320,000,000 bbl at the close of 1955 (ENR Dec. 15, 1955, p. 21), and a total capacity of 336,000,000 bbl by the end of this year.

In view of its importance as a cement consumer, and its role in construction, the ready-mixed concrete industry is entitled to better consideration from the cement manufacturer, contends Jahncke. "Too often," he said, "we are faced with reduced cement shipments at the time we need them the most. In fact, many cement producers are unwilling to commit themselves to us for fixed obligations."

Reporting on a survey he made of 60 large ready-mix producers in this country, Jahncke said that cement shortages last year resulted in a loss of concrete totaling 600,000 cu yd. Foreign cement totaling 4,000,000 bbl was purchased last year by 33 of the companies, at an extra cost ranging from $0.54 to $3.50 per bbl. In addition, 30 of the companies reported "out-of-area" purchases totaling about 5,000,000 bbl at additional costs from $0.21 to $1.75 per bbl.

(*Continued on page 31*)

• **Plenty next year**—Assurances that by next year, adequate supplies of cement will be available, were expressed by Charles B. Baker, president of Universal Atlas Cement Co. "Despite cement shortages that have developed in some areas," he said, "I believe the cement industry has done a creditable job of stepping up production to the fullest extent humanly possible."

Mr. Baker looks for some shortages of cement to continue throughout this year, but believes total shipments for 1956 will be about 320,000,000 bbl. "By 1957 however," he said, "the additional cement manufacturing capacity now under construction will be in operation and this should alleviate, to an appreciable extent, the shortage of the past several years." By the end of this year, he continued, the rated capacity of the cement industry should be close to 350,000,000 bbl annually. And by 1958 this figure should reach 370,000,000 bbl, he said.

The four-day meetings of the two associations drew a total attendance of about 7,000 this year, compared with about 5,500 last year. Also of more than usual interest was the accompanying equipment show, in which 120 manufacturing companies filled Chicago's big Coliseum with a wide variety of construction equipment and machinery employed by the ready-mixed concrete and the sand and gravel industries.

New officers of the National Ready Mixed Concrete Association are: Robert Mitchell, Los Angeles, President, succeeding L. C. Schilling, Miami; J. W. Roberts, Richmond, Va. and M. E. Sundt, Albuquerque, Vice President; and H. J. Brown, Oshkosh, Wis., Treasurer.

The National Sand and Gravel Association elected R. E. Weaver, Lincoln, Ill., President, succeeding J. W. Murphy, Spokane; E. P. Gemmer, Houston, Vice Presidents; and E. K. Davison, Secretary-Treasurer. The Manufacturers' Division of this association elected E. D. Stearns, of Eagle Iron Works, Des Moines, as its chairman. He succeeds R. P. McKenrick, of Blaw-Knox Co., Mattoon, Ill.

Washington State Toll Road To Face Second Legal Test

The proposed $227-million Tacoma-Seattle-Everett toll road, which already has cleared one legal obstacle, faces another May 14.

The Washington State Supreme Court will review a decision by the Thurston County Superior Court. The lower court held that the project met all legal requirements. The latest court test was brought by the state and by owners of Seattle parking lots whose property would be condemned.

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Supplying and Financing—

Water for the Booming Suburbs

Because the problem of water supply for booming suburban areas is of such common concern, and because the problem has been analyzed with such common sense for the Chicago metropolitan area, this abstract of the consulting engineers' conclusions is presented.

A one-year study was made by Alvord, Burdick & Howson, of Chicago (ENR Sept. 29, p. 73). A $300 million program was proposed. Of his firm's study, Louis R. Howson says:

"We endeavor to outline the most logical procedure for water service to the entire Chicago metropolitan area on a basis by which Chicago consumers, who have retired 80% of the present capital cost of the waterworks, get their supply at cost . . . the service to outlying communities being on a 'utility' basis. The outside rates are figured on 5% return on the present-day fair value of that part of the Chicago facilities allocated to the suburban use plus the expenditures made or to be made solely for the suburbs."

The conclusions:

"We have studied the matter of the feasibility and cost of extended water supply service by Chicago to the suburban area. Our study completed, we take pleasure in reporting:

"Although a few of the suburban communities are quite old, substantial growth began about 1890 . . . Growth has been rapid. Each city and village has its own system of public waterworks. At the time of this study 51 towns (are buying from Chicago) water at wholesale, at the same rate per thousand gallons as charged to all metered water users in Chicago.

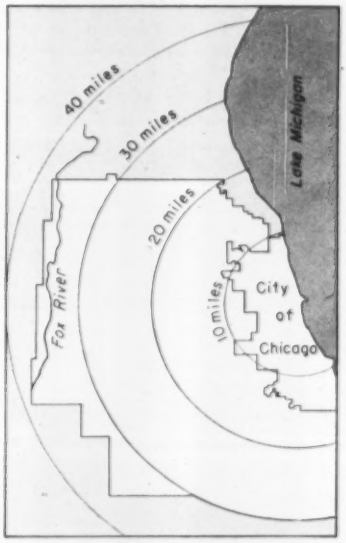
"Although where towns are close together one town can, and does, sell purchased water to another, this system breaks down ultimately as the towns grow. Most individual communities have not practiced advance planning and **in periods of rapid growth, where the present and future appear to converge, suburban water service has frequently been inadequate.**

"All adequate waterworks systems must be designed to give adequate service on maximum consumption days in exceptional years. As a practical matter the investment must be made well in advance of need, on a predetermined program. All cities are growing, and particularly suburban areas around metropolitan centers.

"Thus it appears that an adequate and economical future supply for the greater Chicago suburbs would **require a central authority with power to serve and authority and responsibility to plan and to finance construction well in advance of need.**

"It is the purpose of this report to consider the feasibility of Chicago as this central authority. It has an unlimited supply of water in Lake Michigan. It is already supplying

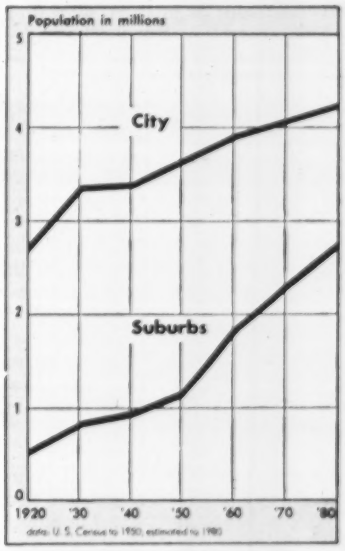
Chicago on Lake Michigan . . .



is surrounded by booming suburbs. They fan out nearly 40 miles to form a vast metropolitan area. Already, there are 51 towns buying water from Chicago at wholesale.

Population in this area . . .

will grow at a rapid rate in the next 25 years, largely due to growth in the many suburban communities. By 1980 population in the suburban area will be 65% that of the city itself.



42% of the population in the greater Chicago suburban area, and about 73% of the suburban population most likely to desire Chicago water in the near future. It has the credit to finance necessary construction if backed by remunerative revenues and suitable legislation. It is better able to finance such capital improvements as are necessary to furnish such supplies to the metropolitan area than can another agency. In addition, Chicago is the only unit in the region which has a large working organization competent to cope with the problems of operation, maintenance and construction of water supply facilities; and also the experienced engineering staff and know-how capable of coping with the various problems involved in extending adequate water service to the metropolitan area.

"It is our purpose to show the magnitude of the problem, its cost, and whether or not remunerative rates from water sales may be such that it would be of interest to the towns to buy such water at wholesale, to be distributed by the towns to their people. **There is no thought to take over the local distribution of the water. This is a service well established in the several towns, which they would be loath to abandon.**

• **Looking ahead**—"It is estimated that in 1980 the population of Chicago will be 4,260,000 and that the population of the suburban area as far west as the Fox River will be 2,720,000. The suburban population will then be 65% as large as that of Chicago.

"We estimated that the water required in 1980 on an average day will be: A total of 1,489.1 mgd (assuming) that all communities will buy the Chicago water. Of the increase in average day's water use in the next 25 years the suburban areas will account for 46.7%.

"By 1980 it is estimated that the maximum day's requirements will be 2,217 million gallons. Of the increase in maximum day's use in the next 25 years the suburban areas will account for 42½%. **It is the maximum day's use that primarily determines plant additions and investment in property.**

• **Fair rates foreseen**—"Under conditions prevailing in 1955, prior to the large expenditures for capital improvements, including the Central Filtration Plant, water could be sold by Chicago to the suburbs at the following rates which would be fair to both City and suburbs:

• Communities adjoining Chicago and having adequate connections—12¢ per 1000 gal.

• Communities now served, but inadequately, requiring additional mains—14¢ to 15¢ per 1000 gal.

• Communities not now served but that can be served Chicago water without repumping—17¢ per 1000 gal.

• Communities not now served but more distant from Chicago and which require repumping for adequate pressure—20¢ per 1000 gal.

• **Construction needed**—"Each part of the Chicago waterworks has been studied to determine the construction and the investment required to serve the forecasted needs of the year 1980 for the city and the suburbs likely to be taking Lake Michigan water at that time; with the following results:

"No other intake construction will be required; no other tunnels needed until 1975 or 1980. The South District Plant should be enlarged by 80 mgd at an early date followed with a second 80 mgd addition about 1970, at a total estimated cost of $11,250,000. Present (pumping) stations will need 360 mgd of additional pumping equipment prior to 1970. The Southwest station with 230 mgd of equipment must be constructed soon. The estimated cost of the above additions to the 1960 program is $4,981,000. An additional $24 million must be spent for feeder mains within the City.

"The present procedure by which the suburbs individually provide the pipe lines from the city limits is satisfactory only for those suburbs adjoining Chicago. For other suburbs advance planning and coordination through a central agency like the City of Chicago is needed.

• **Total cost**—"The city of Chicago, to serve the suburbs as well as its own citizens must expend $292 million within the city and $15 million for mains outside the city prior to 1980. Nearly $180 million (60% of the total) must be spent by 1960. Of the $292 million total, $213 million is jointly used by city and suburbs with $64 million of that properly allocated to the suburbs. The $15 million outside the city is, of course, chargeable wholly to the suburbs.

"Increased expenditures (will mean) higher cost of water. The principal elements in the cost of water are:

• Operation and maintenance expense. This cost has more than doubled since 1940.

• Fixed charges. The expenditure of an additional $292 million of which $102 million will be provided by the sale of water certificates will increase fixed charges nearly $6 million per year.

"Water revenue must be increased to cover these increasing costs and provide the margin necessary to make the water certificates attractive to investors. A 50% increase in all water rates within the city and an additional 6¢ per 1,000 gal for all water sold outside the city are recommended. The increased revenue will make it possible to finance the construction program with the sale of only $102 million of certificates, with the remainder from current earnings. This increase should become effective by 1956, otherwise the projected construction program will have to be radically curtailed.

"With the new rates in effect the City of Chicago can deliver filtered water to the reservoirs of the suburbs through transmission lines built, paid for and maintained by the city. This recommended increase of 6¢ per 1,000 gal for water sold to the suburbs is the equivalent of $3.30 per capita per year, or **less than 1¢ per capita per day. This is a small price to pay for the assurance of an adequate supply of filtered water.**

"There is no water shortage in the Chicago suburban area. Inadequacies have principally been the result of deficient transmission capacity provided by the suburbs. In our opinion **adequate suburban service requires centralized responsibility** from Lake Michigan to delivery in the suburban reservoirs. A responsible agency such as the city of Chicago would have the advance planning, the ability to modify the plans to meet shifting requirements and the ability to finance construction promptly.

"The Chicago waterworks is a going concern delivering 1000 mgd. To the Chicago system the addition of 100 mgd is but 10% while it represents more than 100% increase to the suburbs themselves. Provided with the necessary legislation Chicago can adequately serve the suburbs at reasonable cost."

$20 Million Water Supply Plan Approved by Dallas

Dallas recently joined the growing number of Texas cities that have made expensive commitments to assure an adequate long-term water supply. Voters have approved a city agreement with the Sabine River Authority to pay an estimated $20 million cost for construction of a dam and reservoir in return for 80% of the reservoir's water—160 mgd. The city will also have to spend another $20 million to bring the water into Dallas.

Texas, and particularly east and south Texas, has everything necessary for boom-proportion industrial growth. Everything, that is, except water.

Sabine plans call for a 38,000-acre lake, and the project will require about eight years for completion.

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Engineered and built by the city of Syracuse, N. Y., this 38.7" Dresser-Coupled steel water supply line was backfilled immediately after each 30' length was joined, getting streets back to work fast, practically eliminating the problem of trench cave-ins.

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Dresser-Coupled steel line permits backfilling without delay

Whenever conditions demand immediate backfill, steel pipe and Dresser Couplings make it surer, safer to comply.

On this Syracuse water supply job, for example, the cave-in hazard of unstable sandy loam was heightened by heavy traffic nearby. The problem was solved by immediate backfilling, a standard Syracuse practice on all Dresser-Coupled water lines, where leaving trenches open for line test during construction is considered unnecessary.

Proved in thousands of installations, these factory-tested couplings give 100% bottle-tight joints every time. Their resilient rubber gaskets absorb vibration and pipe-transmitted stresses . . . assure no-leak safety for the life of the line.

Joining is fast and foolproof. Each coupling part is accurately formed and fitted to go into place simply and easily. No special experience or equipment is required. Using only a wrench, joints can be made up at an average of only two man-minutes per bolt . . . with work proceeding in any weather. Estimated costs and completion dates can be met.

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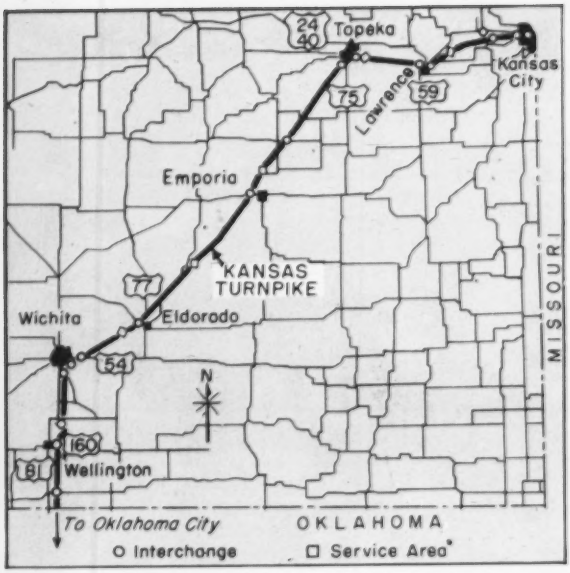


Angling across Kansas' existing highway net, the turnpike connects Kansas City with the Oklahoma border. From there another turnpike is proposed to Oklahoma City.

The Kansas Turnpike Is on the Move

With its first construction season behind it and the job over one-fourth finished, the 236-mi Kansas Turnpike is being aimed for an October completion date. In this simple statement is pinpointed the fast construction timetable of the Sunflower State's initial toll turnpike—linking the two Kansas cities with Oklahoma by way of Topeka, Emporia and Wichita.

Right-of-way is costing about $2.5 million more than original estimates, but construction contracts are underrunning estimates by $1 million. Surplus earnings from invested bond funds will bring in about $900,000, and a like amount is being saved in engineering and miscellaneous expenses.

These net savings will bring the original $14 million contingency fund up to about $14.5 million. And there's a good likelihood that the project will be completed with a substantial share of this fund intact—something on the order of $10 million.

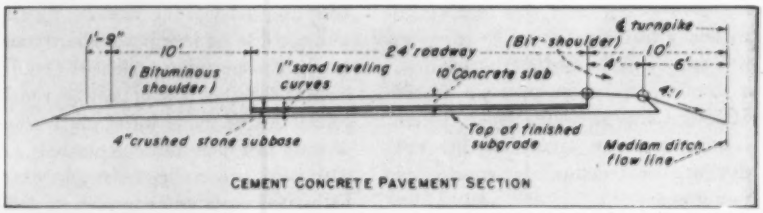
• **First milestone**—The 236-mile project passed its first milestone last Oct. 14, which marked one full year since the $160 million revenue bond funds became available for the start of construction.

A great deal had been accomplished during that 12-month period (ENR, Dec. 8, 1955, p. 27). At year's end, designs were 99% complete; $98.3 million of contracts awarded; 235 miles of right-of-way secured; 47 miles of roadway grading completed; 37 of the 253 turnpike bridges finished; 60,000 tons of sub-base material laid for the asphalt concrete pavement; and 7 miles of two-lane concrete pavement completed.

These are significant accomplishments. Whatever credit is forthcoming for the success of the venture so far is due to the combined efforts and cooperation of a great number of people: Knowledgeable engineers with vision to conceive, design and assure that the huge project is built according to plan; investment interests to underwrite the $160 million venture; and resourceful contractors employing the latest in methods, materials and machinery to build the four-lane divided superhighway speedily, economically and safely.

Responsibility for the entire project rests with Josef Sorkin, managing partner, Howard, Needles, Tammen and Bergendoff, general consultant to the Kansas Turnpike Authority. But he is quick to pass credit along to others. This was reflected in an interview with an ENR staff member. When questioned as to what aspect of the turnpike project gave him the greatest personal satisfaction, Sorkin replied: "It's the orderly progress which has been made possible by timely planning, coordinated awarding of contracts, and effective construction operations without interference between the many contractors on the project."

"Moreover," declared Sorkin, "the substantial progress to date and the confident expectations of completing the 236-mile project within two construction seasons (1955-1956) could not have been possible without the foresight, efficiency and earnest cooperation on the part of the Kansas Turnpike Authority, its general manager (Gale Moss) and his administrative staff."



EAST OF TOPEKA for 55 miles the twin pavements will be 24-ft reinforced portland cement concrete on a crushed stone subbase (above); pavements from Topeka to the

• **Good season**—The 1955 construction season was a good one, generally, although some grading contractors had troubles. Early last summer, surface water supplies began to dry up, and in some instance water for compacting embankments had to be obtained from small farm ponds, often at a premium price. Then, early fall rains saturated completed stretches of embankment, reducing compaction values in the top layers, which required scarifying, aerating and re-consolidation with sheepsfoot rollers.

During the 1955 construction season the accent was on grading and drainage work and bridge construction. No bituminous pavement was laid, and only 7 miles of 24-ft wide reinforced concrete pavement was completed. The big push will come this year—to build the 181 miles of asphaltic concrete turnpike pavement from Topeka to the Oklahoma border, and to complete the 55 miles of portland cement concrete pavement from Topeka to Kansas City.

• **Big equipment**—In an undertaking the size of the Kansas Turnpike, construction equipment plays a dominant role. It must be big, efficient and capable of being put through rugged paces. This was readily apparent during a 3-day tour of the 236-mi. route last November accompanied, in turn, by Howard, Needles, Tammen & Bergendoff's five area engineers: George Kellison, from the Oklahoma border to Wichita (51 miles); Henry Dougherty, the long stretch from Wichita to Emporia (74 miles); Cecil Counts, Emporia to Topeka (58 miles); Luther Shobe, from Topeka to Lawrence (24 miles); and Charles Williams, from Lawrence to Kansas City (29 miles).

Although not a newcomer to this type of heavy construction, the 50-ton, single axle, 4-pneumatic tired compactor, was more in evidence than normally in highway construction. One interesting point of comparison in handling this big rig, is that some contractors use a slow-moving track-type tractor to pull it; others pull it with a four-wheel pneumatic tired tractor, while List & Clark, grading contractors on the Lawrence-Kansas City section of the turnpike, pull their big compactors with the single-axle, two-wheel tractor unit of a tractor-scraper combination earthmover.

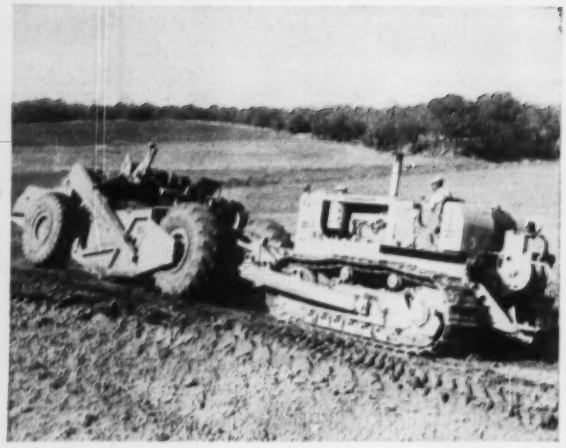
When it came to sprinkling the roadway embankment, one enterprising contractor used special built 6,100-gal water tanks, tractor drawn and equipped with both the conventional spray bar and a secondary high pressure spray capable of soaking a 70-ft width of embankment at a single pass. On this section, to facilitate night work, portable light plants with 50-ft towers, each mounting sixteen 1,000-w lamps, were spaced from 500 to 900 ft apart.

Sometimes it was necessary to haul borrow material considerable distances. In the Eldorado interchange area, for example, a tremendous maze of pipelines made it impossible to secure earthfill locally although the grading contract called for a total of 1,870,000 cu yd. Out of one river bottom borrow pit 425,000 cu yd had to be hauled from 2.5 to 3 miles. With a contract price of only $0.28 per cu yd, the contractor met the challenge by using a fleet of 25-cu yd bottom-dump wagons sideboarded to carry 30 cu yd. They were being loaded by a pair of 4-cu yd draglines, with production averaging 22,000 cu yd per 22 hr day.

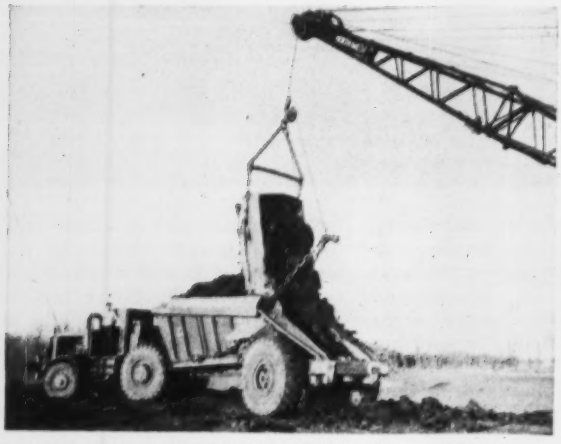
Along the turnpike, self-loading scrapers varied their operations, de-

Oklahoma border (181 miles) will be asphaltic concrete on crushed stone base and subbase. Both will be flanked by bituminous shoulders and separated by a 20-ft median.

. . . Kansas Turnpike on the move



HARDPAN CALLS FOR POWER—So self-propelled scrapers got help (left) from crawler tractors, or (right) by pushing each other.



SIDEBOARDED TO UP CAPACITY to 30 cu yd, big bottom-dump wagons were loaded with a 4 cu yd dragline bucket to beat economics on a three-mile haul.

JUMBO WATER WAGON, built on the job, is ready to deliver 6,100-gal load to a thirsty embankment undergoing compaction. Light tower makes night work easier.

pending upon the material they were working in. In one large scale job involving considerable tough clay and hardpan, tractor-drawn scrapers not only loaded themselves, but served also as push loaders to help load other units. And at still another borrow area, a giant-size self-loading scraper, working in some extremely tough material, needed the help of a jumbo-size crawler tractor to get its full load.

• **Aggregate production**—In view of the tremendous volumes of crushed aggregate required for the flexible type pavement, including the water-bound subbase, base course and asphaltic concrete, a number of the contractors already were opening quarries and setting up crushed plants for this year's operations. One such plant, shown in an accompanying photo, was in the last stages of being set up, preparatory to operating a large quarry that had been stripped of topsoil. And for this stripping work, the contractor used the same fleet of end-dump rock trucks, normally used in transporting the crushed stone. They were being loaded with a power shovel.

• **Safety features**—The fact that the 236-mile turnpike has strictly limited access is perhaps its greatest safety feature; traffic can enter and leave at only 13 interchanges and terminals, or at six service areas. But the 20-ft median strip runs a close second. It is considered wide enough to minimize the glare of headlights for night drivers, and the fact that it is depressed 2 ft at its centerline not only provides for drainage of the median itself but will also help keep vehicles from crossing over into opposite lanes.

Bituminous shoulders will be depressed 1 in. below adjacent roadway pavement and their coarse surface texture will serve as a warning to a driver who wanders off the main roadway. Where flexible roadway pavements are used, the adjacent bituminous shoulders will be of a different shade to guide drivers both day and night. Guide posts will also warn drivers of ditches along fills up to 10 ft in height. Guard rails will be used where the fill is 15 ft or more, and all curves will be delineated by reflectorized guides.

The turnpike has been engineered so that curvature and sight distances permit driving 70 mph. Maximum curvature is 3 deg., minimum sight distance is 725 ft, and maximum grade is 3 percent. Where traffic enters the turnpike, 12-ft wide acceleration lanes 950 ft long, will permit acceleration to 50 mph before merging with the traffic stream. Deceleration lanes will be 600 ft long.

• **Right-of-Way**—The total cost of right-of-way will be in the neighborhood of $9.5 million; a net increase of about $2.5 million over preliminary estimates. Kansas, like some of the other turnpike-building states, found that when it began to purchase

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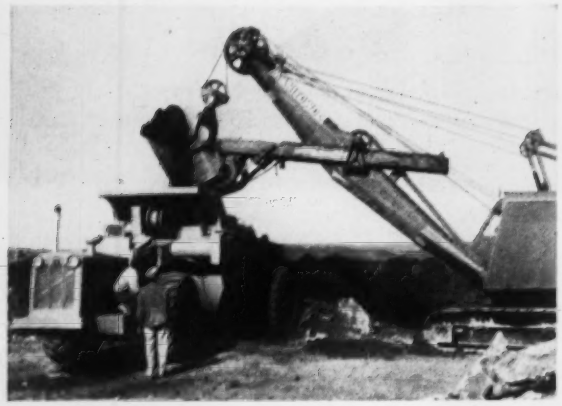
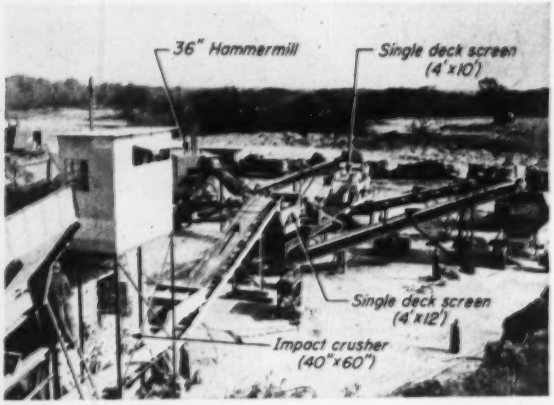
. . . Kansas Turnpike on the move



END-DUMPTRUCK and power shovel strip overburden from quarry to feed portable crushing and screening plant shown in photo at right.



AGGREGATE PREPARATION PLANT is readied to produce some of the 10,000,000 tons of crushed stone that will go into flexible and subbase construction this year.

right-of-way costs invariably outran estimates.

Also in spite of the fact that Kansas has what has been referred to as a "quick-take" law on right-of-way acquisition, the inability to secure certain tracts of land at the required time to start orderly construction, was perhaps the biggest bottleneck to the overall progress of the program. This, despite the fact that the turnpike authority's policy was to hire well-known, responsible local men in each county to serve as appraisers.

The cost of right-of-way covered a wide range, as low as $50 per acre in some barren regions where the rocky, wornout soil would hardly grow a persimmon tree, up to $400 per acre for good bottom agricultural land, or even at the rate of $2,000 per acre in highly developed suburban areas adjacent to large cities.

• **Local opinion**—Although the motorist will view the completed turnpike as an engineering marvel of the highest order, and its designers and builders will be justly proud of their accomplishments, the local farmer, who loses some of his valuable farmland to a superhighway of little, personal use to him, takes a very dim view of the whole proceedings.

It's not just the acreage that he was forced to part with, but the inconvenience caused him by the turnpike which may split his farm; or the frustration of seeing valuable land, which he has built up to high productive quality, buried under high turnpike embankments or cut away entirely so that the road can have easy grades through rolling hill country. Some idea of this local resistance is shown by the number of condemnation proceedings instituted. Up to November 1 of last year 232 miles of right-of-way had been acquired. This represented 490 tracts of land which had been acquired by negotiation from 167 owners; and 2,131 tracts involving 803 owners, acquired by condemnation.

The Turnpike Authority and the land owners were about 50-50 in their acceptance of the appraisal figures. Of the 803 land owners whose land had been condemned for turnpike construction, 251 filed appeals seeking higher awards than those granted by the court-appointed appraiser. By comparison the Turnpike Authority itself filed appeals in 261 cases where it appeared that the local appraisers' awards had been excessive.

• **Roadway pavements**—As shown on the accompanying drawings, both the flexible and rigid type roadway pavements are 24 ft wide, flanked outside with a 10-ft bituminous shoulder and on the inside by a 4-ft bituminous shoulder. Thus, 38 ft of surfaced superhighway in each direction is available for drivers' use during emergency.

The flexible pavement has a total thickness of 22 in.; made up of a 10-in. subbase of waterbound crushed stone or gravel, an 8 in. crushed stone base course, a 2½-in. binder course, and a 1½-in. surface course. Both the binder and surface courses are asphaltic-concrete.

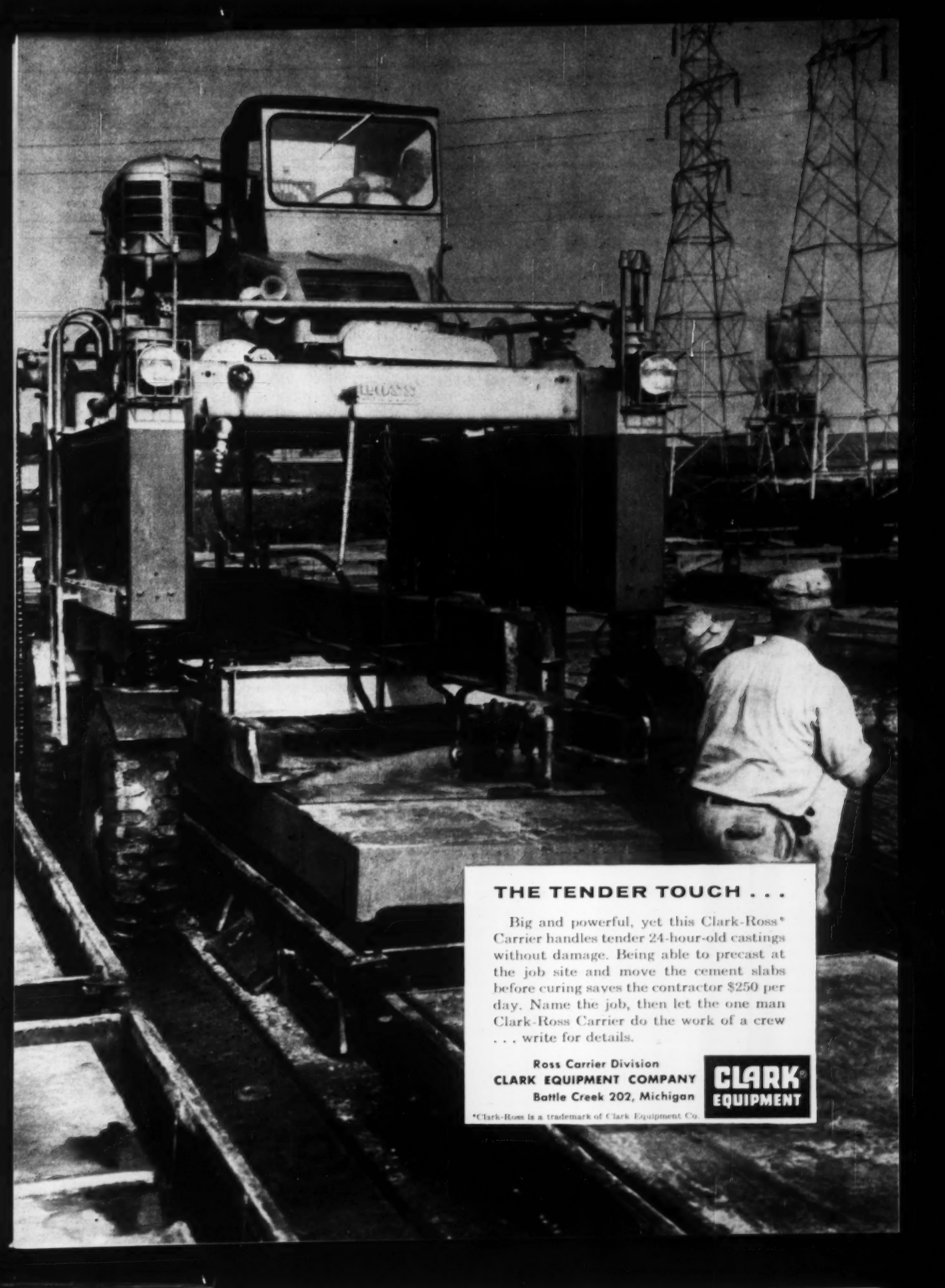
The rigid pavement is 15 in. thick from top of finished subgrade to top of pavement. It is made up of 4 in. of crushed stone subbase, a 1-in. sand leveling course and a 10-in. reinforced portland cement concrete pavement. The 4 in. crushed stone subbase extends over the full width of embankment to support the roadway pavement and both shoulders. The 1-in. sand leveling course is only 24 ft wide, directly beneath the roadway pavement.

The concrete pavement is reinforced with welded steel wire fabric weighing 44 lb. per 100 sq ft and placed 3 in. below the surface of the pavement. It is made up of No. 4 wires spaced 6 in. transversely and 12 in. longitudinally. Contraction joints are sawed transversely at 30 ft centers, and a longitudinal joint 1¾ in. deep is sawed down the center line of pavement. Both joints are filled with a sealing compound.

• **Rigid versus flexible**—The controversial question of what type roadway pavement to use came up early in the planning stage. Should it be rigid or flexible? The decision to use asphaltic concrete for the Oklahoma state line to Topeka and reinforced portland cement concrete from Topeka to the eastern terminus in Kansas City, Kan., was largely based on relative economy of construction in the two regions, since both pavement designs were deemed equally adequate regarding structural strength, driving safety and riding comfort.

The principal key to the decision was the location and availability and comparative cost of materials in the two regions. Thus studies indicated that a saving of $3 million would be made by using asphaltic concrete on the 181 miles of turnpike from Topeka to the Oklahoma line. At the same time, the use of portland cement concrete for the 55 miles of turnpike pavement from Topeka to Kansas City figured to save $500,000.

When the paving contracts had been awarded the average per-mile cost of the two types of roadway pavement cross-sections were in relative close agreement, which the engineers point out, was to be expected. In other



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. . . Kansas Turnpike on the move

words, the cost of building a mile of rigid pavement would have been higher in the remote western sections than in the eastern section between Topeka and Kansas City. In like manner it would have cost more to build a mile of flexible pavement in the eastern section than in the section southwest of Topeka, where large volumes of aggregates were more readily available.

In making this cost comparison, engineer figures showed the average costs per mile of all elements of both types of pavement, above the finished subgrade.

• **A flexible mile**—The average per-mile cost of twin 24-ft asphaltic concrete pavements including base course, subbase, and bituminous shoulder construction was $175,400. This was based on quantities per mile and average unit prices of the 12 basic items in 19 paving contracts for the 181 miles of flexible pavement between Topeka and the Oklahoma border.

The calculated quantities of materials required to build a mile of these twin flexible pavements and appurtenances include, in round figures: 54,900 tons of aggregates for subbase, base course, asphaltic concrete, and shoulder construction; and 138,700 gal of asphalt. In addition to the costs of furnishing and installing materials, one item, "Subgrade preparation and roadway finishing," was bid at average price of $4,430 per mile.

• **A rigid mile**—The average per-mile cost of twin 24-ft reinforced portland cement concrete pavements, including subbase and bituminous shoulder construction was $177,830.

This was based on quantities per mile and average unit prices of the 7 basic items in 8 paving contracts totaling almost 55 miles from Topeka to Kansas City.

Materials required to build a mile of these twin 24-ft roadway pavements with their subbases and bituminous shoulders include: 28,160 sq yd of 10-in. reinforced concrete pavement; 22,000 tons of combined subbase; 16,900 gal of asphalt and 420 tons of aggregate for shoulders. Average contract price for "Subgrade preparation and roadway finishing" is $3,730 per mile.

• **Embankments**—Roadway embankments for both flexible and rigid pavements are built to the same exacting specifications. In general, the top 12-in. layer is compacted to at least 100% of standard maximum density, and the next 2-ft, to at least 95% maximum density.

Unless otherwise covered by special contract provisions, all turnpike construction is governed by the standard specifications of the Kansas State Highway Commission.

• **Turnpike history**—Similar to turnpike development in other states, the Kansas Turnpike got off to a slow start, but once it got rolling picked up considerable momentum. The Kansas Turnpike Act became effective April 7, 1953. Two months later the Kansas Turnpike Authority was organized, and the general route of the turnpike selected the same day. The following months were devoted to preparing a preliminary feasibility report which was issued March 15, 1954. On July 6 of that year the Kansas State Supreme Court upheld the validity of the Turnpike Act.

This favorable action added impetus to the development, and on August 25 two reports were received by the Turnpike Authority, one covering the feasibility of the project and the other the engineers' cost estimate, which was placed at $160 million.

This opened the way for negotiating the sale of the turnpike revenue bonds. A contract for the sale of these bonds was made September 21, 1954 and a check for their purchase price was delivered October 14. This put the turnpike commission into business. Within less than a week the consulting engineers, called section engineers, were employed to prepare design plans and supervise field construction. The general consultants, Howard, Needles, Tammen & Bergendoff, had been employed by the Authority previously. The Authority's administrative staff was organized the latter part of October, and the first construction contract awarded December 24, 1954. One week later ground was broken for the turnpike bridge over the Kansas River on the outskirts of Lawrence.

• **Kansas City Terminus**—The turnpike begins at 18th and Muncie Boulevard in Kansas City, Kans., 1¼ miles inside of the city limits. This 1¼ mile portion of the turnpike can be traveled free. But in exchange, the Kansas State Highway Commission and Kansas City have agreed to extend a limited-access facility on eastward through Kansas City to the west end of the inter-city viaduct crossing the Kaw (Kansas) River into the state of Missouri.

From that point, traffic bound for Chicago and points east, will travel a section of the Sixth St. Trafficway, crossing the Missouri River over the new Paseo toll bridge.

• **Turnpike facilities**—All concession service areas are located between the two opposing turnpike pavements, which are spread 550 ft apart to accommodate them. Large directional signs and accelerating and decelerating lanes will be provided for safe and efficient egress and ingress to the areas.

No alcoholic beverages will be sold, served or permitted to be served in the concession areas, but otherwise they will be of the deluxe type. Charges for food and gasoline will be comparable with charges in the adjacent communities. There will be six service areas, located from 27 to 51 miles apart.

• **Toll charges**—Although toll charges have not been definitely established, chances are that a motorist driving the full length of the turnpike from Kansas City to the Oklahoma line will be charged about $3.80, regardless of the number of passengers in his car.

Other recommended charges for the full 236 miles are $8 for commercial buses, $9 for 3-axle tractor-semi-trailers and $10 for larger trucks. For short hauls such as the 55 miles from Kansas City to Topeka, a motorist would pay about $0.85. There are 13 toll-collecting plazas.

• **Native talent**—As explained by Josef Sorkin, in order to take advantage of knowledge of local conditions and practices as far as possible, preference was given to employment of Kansas consulting firms to serve as section engineers in preparing designs and supervising construction. The same policy was followed in selecting the architects to design and supervise construction of office and maintenance buildings; also in employing land surveyors for preparing plats and right-of-way descriptions.

As a result, all but two of the 14 section engineers are Kansas firms (ENR, Oct. 7, 1954, p. 78); while all four surveying organizations and the three architectural firms are native to Kansas.

• **Kansas contractors, too**—Kansas contractors came in for their share of the work, too. Out of the $97.5 million worth of construction contracts awarded up to November 1 of last year, $46 million worth of work went to 31 Kansas contractors. There was a total of 72 successful bidders, including 13 from Iowa and 7 from Missouri.

The Turnpike Authority's general offices in Topeka had a peak staff of 54 at the height of right-of-way negotiations, according to Gale Moss, general manager of the turnpike. In addition, the authority plans on seeding the 236 miles of right-of-way with its

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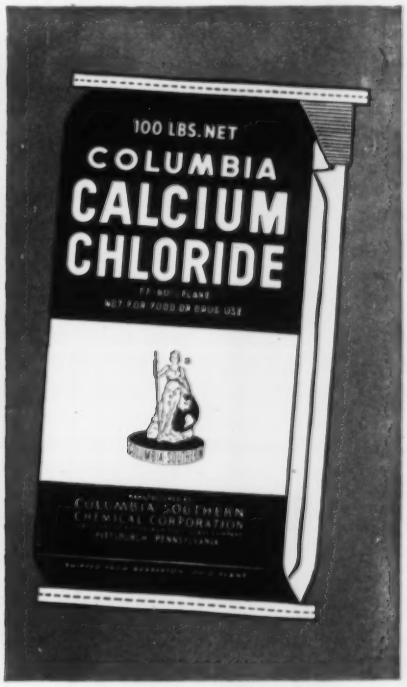

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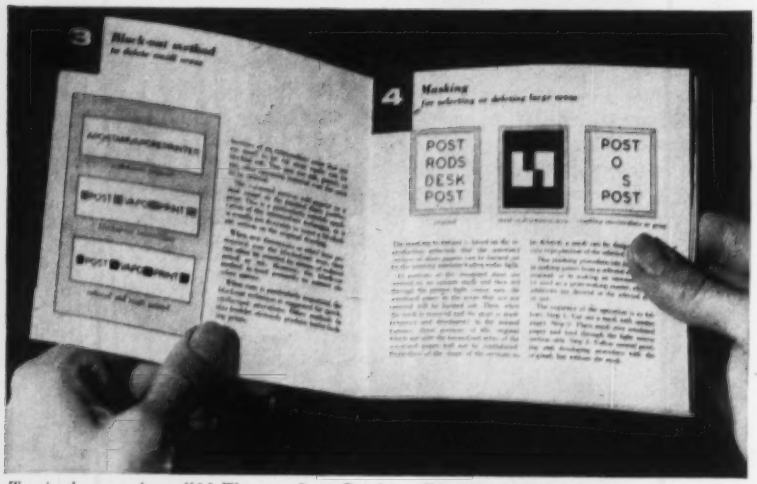

Typical pages from "11 Ways to Save Drafting Time," a new booklet on the use of intermediates and the first of its kind ever published. Each technique is fully described.

New booklet offers time-saving drafting tips

An interesting new booklet called "11 Ways to Save Drafting Time" is now available without charge to engineers and draftsmen. Published by Frederick Post Company, it's the first booklet that compiles the many ways of using *intermediates* to modify drawings without changing the original.

As most draftsmen know, an intermediate is any translucent reproduction master printed from an original drawing. Once the drawing is printed on the intermediate, this "duplicate master" serves as the source for future print making. By modifying only the intermediate and leaving the original unchanged, draftsmen save valuable hours of tracing and redrawing.

The booklet shows 11 specific ways of using intermediates to make changes, each one illustrated with examples. Some of the techniques covered are scissor editing, masking, the block-out method, successive additions and preprinting.

The other methods shown are transparent matte tape, pick-off transfer, composite grouping, composite overlays, non-reproducible blue and use of corrector fluids.

The techniques described apply to various print-making methods such as moist-developed process, ammonia process, blueprint, sepia negative and even reproduction cloths in some instances.

Dan Avery of Standard Blueprint Company, Cedar Rapids, who works with draftsmen daily, discovers helpful techniques in the new "11 Ways" booklet.

Further information on the new "11 Ways" booklet is available from the Reader Service Division of the Frederick Post Company, 3651 N. Avondale Avenue, Chicago 18.

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own equipment and hired labor, which will require an additional 50 to 60 workmen during 1956 peak operations.

The Topeka headquarters staff of HNT&B totals about 40. R. C. Keeling is project engineer; James Bucher, construction engineer; and George Lamb, bridge engineer.

• **Gateway to the Southwest**—When opened to traffic in October of this year, the Kansas Turnpike will weld together with a free-flowing, high-speed expressway the Sunflow State's three largest cities—Wichita (pop. 170,000), Kansas City (pop. 130,000) and Topeka (pop. 80,000).

But, trafficwise, it is destined to play a more significant role in future midwestern toll road development. For its strategic location marks it is the "Gateway to the Southwest."

A quick look at our expanding toll highway system shows that the turnpikes in the east focus on Chicago. From that metropolis, traffic bound for Oklahoma, Texas, Arizona or even Los Angeles, would angle southwest across Illinois and Missouri—by present freeways or future toll highways—to the Kansas Cities. Then, 236 turnpike-miles later it would be at the Kansas-Oklahoma line, headed for Oklahoma City and points southwest over toll roads already in the planning stages.

Plastic Pipe Identified With Seal of Approval

A program for applying a seal of approval on plastic pipe used for potable water has been announced by The Society of the Plastics Industry, Inc., and the National Sanitation Foundation. Preceded by three years of toxicity and taste studies, the program aims at allaying the natural concern of engineers, health officers and the public over possible effects of untried new materials in contact with drinking water.

Beginning Feb. 1, participating manufacturers are identifying their pipe and fittings with a seal prescribed by NSF. These companies will have their plants regularly inspected by Foundation officials and will be subjected to surprise sampling visits.

The National Sanitation Foundation, a non-profit research organization, has headquarters at the School of Public Health of the University of Michigan. The research and approval program was underwritten by the Thermoplastic Pipe Division of SPI.

The sponsoring division also has underway a long-term program to develop performance characteristics and test procedures for pipe in service.

GUAM'S CONCRETE BLOCK HOUSES are part of a $17-million program of replacing temporary family quarters.

Seabees Build Navy Housing Overseas

One of the biggest peacetime construction jobs in the history of the U. S. Navy's Construction Battalions has passed the halfway point. The program will produce 2,400 family dwelling units for military personnel overseas. And all of the work is being done by enlisted Seabees as part of their training and preparedness program.

More than half of the units (1,356) are located on Guam; 300 more are being built in the Atlantic area, and the rest are on other Pacific islands. The program is aimed at replacing temporary, high-maintenance units at a low cost. In authorizing the work, Congress specifically directed that each unit cost not more than $5,000 for materials, supplies and equipment, including transportation. And as new units are completed existing temporary quarters must be demolished.

Congress also specified that construction be done by Seabees — a highly unusual stipulation — to develop working skills.

The remarkable record made by the Navy's Construction Battalions in World War II was largely due to the fact that most of the enlisted personnel were highly skilled workers recruited directly from civil life. During peacetime, however, such is not the case. The Seabees have a small corps of experienced men, but most of the personnel are recruits. And these men need training in construction operations to put them in a state of readiness to handle emergency situations.

Total program on Guam is valued at more than $17 million. But this includes costs of the construction forces as well as materials. Estimates run from $10,000 for a one-bedroom home to almost $22,000 for a three-bedroom home with a carport. These costs are remarkable considering the fact that construction is overseas. Some units are two stories, both second floor and roof being cast-in-place concrete.

As experience with built-up roofing on Guam has been poor, the concrete roof slabs are being left bare. The slabs are sloped by varying thickness from 7 in. at one edge to 4½ in. at the other. The positive drainage together with the warm tropical climate helps keep the roof slabs watertight in spite of frequent torrential island rainfall.

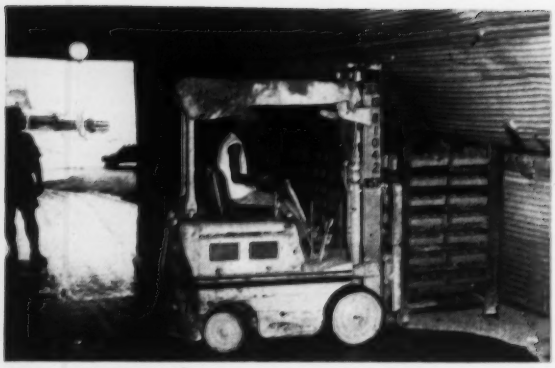
The slabs were cast with a six-sack, coral-aggregate concrete with slump less than 4 in. Second floor and roof slab casting operations were supported by a plywood-and-timber stud form system.

Concrete floor slabs were cast on rolled coral-aggregate base pads. In positioning underslab conduits, piping and reinforcing, the Seabees worked from a base line across the front edge of a building with a second base line at right angles at the building center line. Location of the under slab items was carefully detailed to prevent interference.

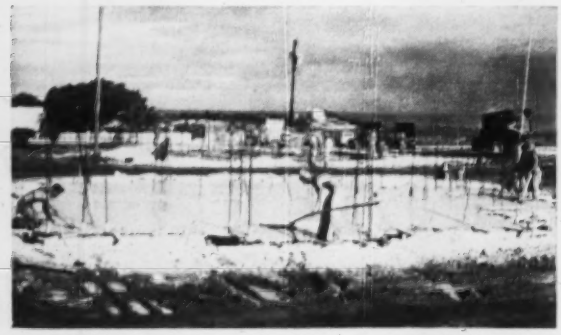
Concrete was brought to the job in truck mixers. Some of the housing units were located near the Seabee camp permitting use of their central batch plant. Others are located 10 to 12 mi away necessitating establishment of two satellite batch plants.

Best construction efficiency was developed by having the Seabees perform repetitive operations. Where possible, efforts were concentrated on the same type unit. For example, there were a number of one-story, two-bedroom homes and a larger number

AGGREGATE IS DUMPED in mixer in concrete block plant. Output is used for reinforced walls of housing units one and two stories high.



CONCRETE BLOCKS ARE STACKED prior to curing. Maximum use was made of local materials to keep cost of materials and equipment for eact unit below $5,000.



CONCRETE SLAB is cast directly on the ground with plumbing and dowels for wall reinforcing cast in the slab. Steel brackets hold dowels in proper position during concreting operations.

CONCRETE BLOCK WALL is built by a Seabee. Reinforcing rods are later grouted in place. Exterior bearing walls are reinforced to resist typhoon winds of 120 mph.

of three-bedroom homes. Construction concentrated on two-bedroom units as far as possible and then on three-bedroom units. Plumbing and cabinet work was largely preassembled in central shops.

The reinforced concrete block bearing walls are designed for typhoon winds up to 120 mph. Wall reinforcing takes the form of rods grouted in holes in the concrete block.

The work on Guam is being done by Mobile Construction Battalion 10. Of the 730 men in this unit, 82% have no construction experience, having joined the Navy direct from high school. Of the rest, only 15% have had three to five years Seabee or construction experience and only 3% can be considered highly experienced. Of the officers, only four have had construction experience.

But these relatively untrained men aided by some 200 Guam civilians—also inexperienced—are producing 50 living units a month. Thus, the intent of Congress in assigning this work to the Seabees for training purposes is being fulfilled.

RESULT of Seabees' work are these completed single and two-story units. Concrete roof slabs are sloped by varying thickness from 7 in. at one edge to 4½ in. at the other.

The program is under the jurisdiction of the Navy's Bureau of Yards and Docks, Rear Adm. Robert H. Meade, CEC, USN, chief. The Pacific work is directed by the Director, Pacific Division, Bureau of Yards and Docks, Rear Adm. J. F. Jelley, CEC, USN, in his capacity as Commander, 10th Construction Brigade. Comdr. Woodrow M. Brown, CEC, USN is commanding officer of Mobile Construction Battalion 10.

Short cuts speed printed-circuit design at Brush Electronics Co.

"3-day job"...done in 3 hours

Brush Electronics Co., a Division of Clevite Corp., Cleveland, Ohio, finds countless uses for photographic materials and techniques in designing more than 700 products.

Take the draftsman working on that printed-circuit diagram, for example. The original practice was to draw such circuits in ink on heavy Bristol board.

Now, the job is done in a fraction of the time by positioning precut circles and lines, with adhesive backing, on a form. This is reproduced on Kodagraph Autopositive Film, a positive copy being obtained directly without a negative step. This reproduction—with dense black photographic lines on a translucent base—is sent to the vendor who makes the printed circuits.

Brush has also found that duplicate tracings, made quickly and economically on roomlight-handling Kodagraph Autopositive Paper or Film, are the key to further savings when drawings must be revised, or vendor prints reproduced. Such duplicates are continually being used in place of originals for reference and print making . . . are protection against possible loss or unavailability of the originals.

And Brush further streamlines drafting and engineering activities with the help of other Kodak materials—uses Kodagraph Contact Fine-Line Paper for revising and combining drawings, and making high-quality offset plates . . . uses Kodalith Film in preparing "pictorial" assembly drawings, reduced-size drawings, handbook pages, graphs. *Sometimes four or five materials are used on one job, for top-quality results and savings at every step.*

To learn the ways Kodagraph and other Kodak reproduction materials can serve you, just mail coupon below, or get in touch with your local blueprinter.

Kodagraph Reproduction Materials

New booklet is jam-packed with valuable tips on saving drafting time, protecting drawings, getting better prints.

MAIL COUPON FOR FREE BOOKLET

EASTMAN KODAK COMPANY 67
Graphic Reproduction Division, Rochester 4, N. Y.
Gentlemen: Please send me a free copy of your new booklet on Kodagraph Reproduction Materials.

Name_____ Position_____

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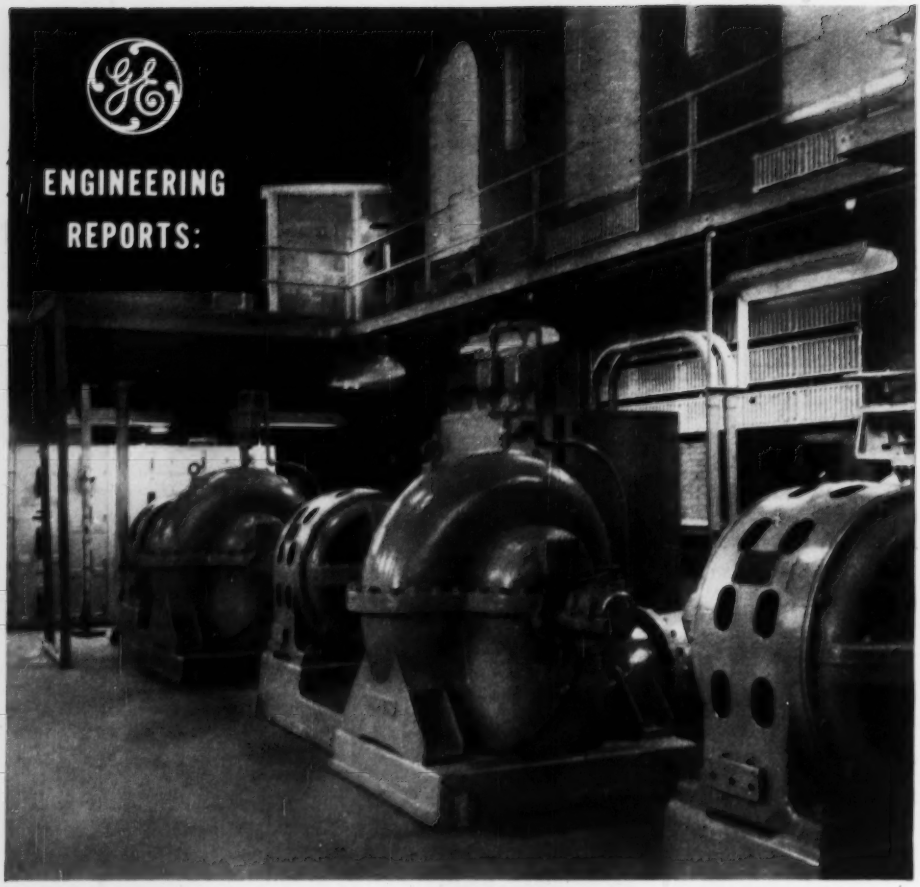
City_____ Zone_____ State_____

Kodak



30 YEARS OF SERVICE is record of these G-E induction motors from original installation. Modern Cabinetrol* and drawout circuit breaker lineup helps protect, control motors and power circuits.

General Electric helps Indianapolis double

FARSIGHTED PLANNERS of expansion and power system include (l-r) M. H. Miller of Watson-Flagg Engineering Co., electrical contractors; F. H. Stout of Ammerman, Davis and Stout, consulting engineers; D. O. Bender, plant superintendent; and L. C. Stang also of the consulting firm, shown discussing system with E. S. Bush, G-E sales engineer (standing).

HIGHLY RELIABLE protection, control of high-voltage circuits and motors in blower building is provided by General Electric metal-clad switchgear and Limitamp† starters.

sewage treatment capacity

Working with customer, consultants, and contractors, G.E. helped plan power system to meet loads expected by 1976

To assure first-class sewage disposal for its growing population and industries, Indianapolis began a $12 million expansion of its 32-year-old treatment plant in 1951. Today, capacity has been raised from 50 to 120 MGD and facilities have been expanded to provide full secondary treatment. **ENGINEERING ASSISTANCE** was made available by General Electric to the city, its consultants, contractors, and machinery manufacturers from the earliest phases of planning through equipment start-up. G-E engineers, specially skilled in this type of application, helped prepare specifications and designs that will assure the ability of the new power system to handle loads anticipated for the next 25 years.

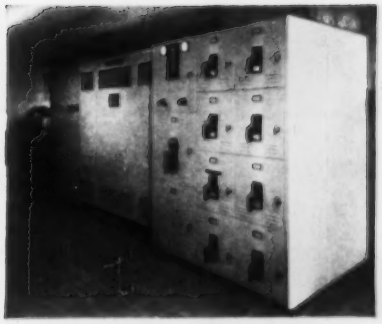
This same G-E service and equipment can be put to work for you on your next project. Contact your G-E Apparatus Sales Representative. Also ask him about using the film CLEAN WATERS to help you gain public support for sewage projects. General Electric Co., Schenectady, N. Y.

*Reg. Trade-mark General Electric Co.
†Trade-mark General Electric Co.

664-39

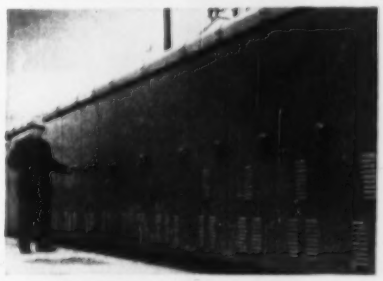
Engineered Electrical Systems for Sewage Plants

GENERAL ELECTRIC

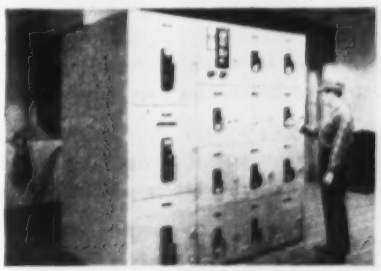


"BUILDING BLOCKS" of power, G-E load-center unit substations can be easily added to serve new loads. Packaged units facilitate handling, installation, operation.

CUSTOM ENGINEERED of standard components, Cabinetrol panel allows centralized control of settling tank motors. Units offer space and access for easy wiring.



HIGH SAFETY, reliability of G-E metal-clad switchgear at service entrance helps assure vital power continuity. Magne-blast breakers require little maintenance.



OPERATOR SAFETY is only one feature of G-E drawout circuit breakers. Applied with ample interrupting capacity for near-future loads, they assure high reliability.

Here's Paul and Richard Slattery's new HD-11, pulling a 7½-yd Allis-Chalmers scraper on an eleven-mile road-rebuilding job between Savannah and Whitesville, Missouri.

Allis-Chalmers HD-11 Crawler Tractor

"BIG PERFORMER"

says Missouri contractor

That's co-owner Dick Slattery talking about the newest addition to his spread of Allis-Chalmers equipment.

"The HD-11 has given excellent performance and requires little maintenance," Dick goes on. "Among a lot of good things, I think the engine is tops. The lower RPM for one thing will give the tractor longer life. And its lugging power is terrific."

Chalk up another enthusiastic user of the new HD-11. And Dick knows what he's talking about. He started in business building farm ponds and clearing land with an army surplus Allis-Chalmers tractor in 1946. Now, with his father, he owns three crawlers, two big motor graders and a 7.5-yd scraper — all Allis-Chalmers.

Stop at your Allis-Chalmers Construction Machinery Dealer . . . see for yourself why the great new HD-11 is making such an impression on dirt movers like Dick Slattery.

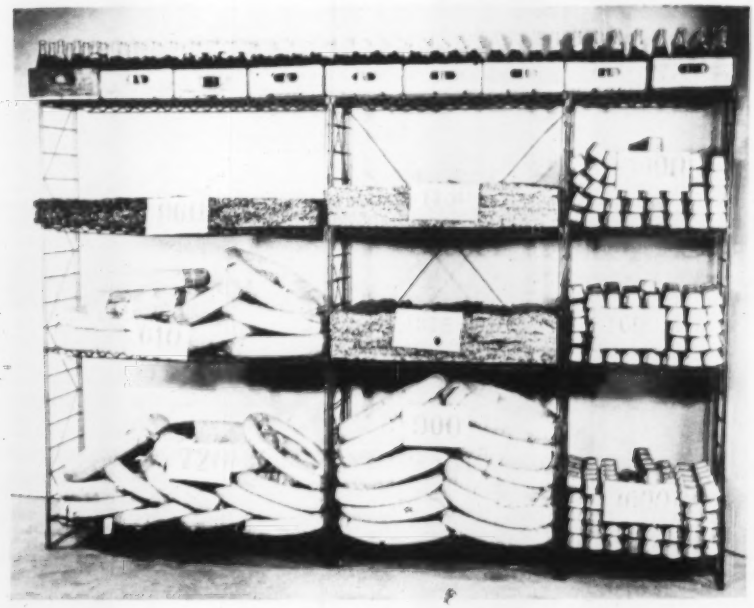
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

HD-11 owners know you just can't beat the combination of advanced-design features the HD-11 offers. The new engine with "follow-through" combustion . . . new long-life, ceramic-lined clutch . . . tough new track . . . all-steel box-A main frame . . . unit construction . . . lube features that let you leave a grease gun home for one to two weeks . . . these are just some of the many advantages that together add up to the finest tractor in its class.

HD-11
75 drawbar hp
20,500 lb

HD-11G
105 net engine hp
32,000 lb
2¼-yd bucket capacity



Shelves Are Boon to Builders

For many a builder the problem of storing construction supplies sometimes is a bigger headache than putting up a building. A new-type shelving may be the answer to his prayer, for it is not only rugged to withstand job abuse and loads of heavy items, but also relatively lightweight—easily assembled in a variety of dimensions.

Trade-named "Erecta-Shelf", the shelving is fabricated of heavy-weight steel rods which composes both shelves and uprights. No nuts, bolts or screws are needed, since the shelves are notched at their ends to mesh with the uprights within close tolerances. This results in a snug interlock.

Uprights are so constructed that shelves can be spaced at 5-in. intervals. The shelves are reinforced along their outer edge by corrugated bracing forming a sort of miniature truss to stiffen the shelf in flexure.

Standardized in 12 and 18-in. widths, and 24, 36, and 48-in. lengths, the shelves are well suited for uses where loads are heavy, where air circulation is desired, and where wet objects are to be placed on the shelving to drain.

Uprights come in heights of 4 ft 3 in., 5 ft 3 in., 6 ft 3 in., and 7 ft 3 in. To compensate for pitched or uneven floors there is a leveling device on the foot of each upright.

In addition, the manufacturer puts out a light-duty shelf that is available in 12-in. widths, and 24, 36 and 48-in. lengths. Construction of these trusses is lighter, with the "trusses" along the shelves omitted. Metropolitan Wire Goods Corp., Brooklyn 1, N. Y.

Enlarging Unit Converts Film to Drawing in 4 Sec.

A new development foreshadows the end to bulky, space-consuming files for engineering drawings. Standard-size prints can now be made from microfilm originals almost instantly.

The enlarging printer is capable of producing 15 standard-size drawings a minute from microfilm originals fed into it on either 35-mm roll film or on punched cards on which each microfilm frame is individually mounted. The machine can handle up to 500 of the punched cards, which are designed to be processed in electronic sorting machines.

Developed by the Radio Corporation of America for the U. S. Navy, the printer uses a special dry process of reproduction. The paper is coated with an electrosensitive material that reacts several thousand times faster than blueprint paper. As it passes through the machine at a rate of 23 fpm, it is electrostatically sensitized with a negative charge. Then, it is exposed to the light images of the microfilm causing a reduction in its initial electrostatic charge in those areas exposed to the light.

The image is developed by passing the paper under "brushes" consisting of iron filings mixed with a pigmented powder. This mixture, carrying a positive electrostatic charge, adheres to the negatively charged areas of the exposure. The developed image is fixed permanently, to become a bonded, non-fading image, by passing the print through a dry temperature bath.

Trade-named Electrofax, the first of the new machines is scheduled for delivery to the Navy in a few days. It requires neither darkroom nor special protective lighting. There is a sight glass for continuous internal viewing glass for continuous internal viewing.

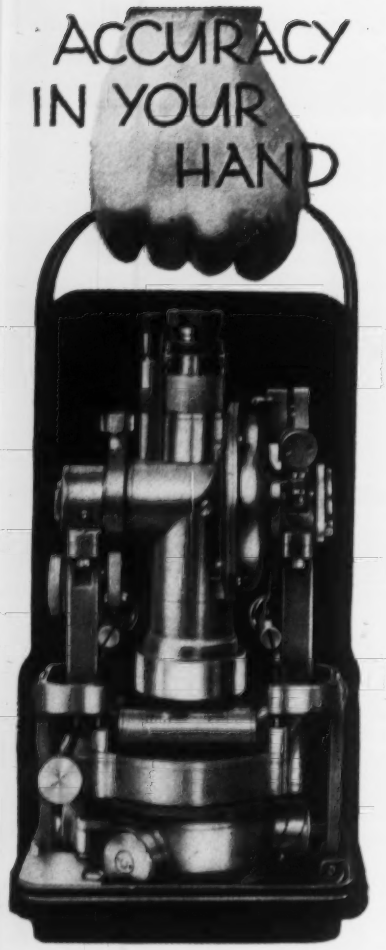
Punched cards are trade-named Filmsort and produced by the Dexter Folder Co.

(*New Products continued on page 52*)

Hydraulic Sewer Valve

Protection against sewer backup during storms is offered by a line of hydraulic sewer valves available for all pipe between 4 and 12 in. in dia. The automatic shut-off is actuated by a float which causes city-water to pressurize the valve.

The valve is reported to close with sufficient force to shear paper, wood and other materials common to sewage lines. Protection Equipment Co., 2924 Emerson Ave. S., Minneapolis, Minn.



Carry a Kern Instrument to assure a better, faster job. Kern's consistent research and experimentation result in functional, supremely accurate Instruments for you; in Instruments for today and tomorrow.

KERN'S DKM 2
one second Theodolite f. Triangulation, big construction and Engineering Operation.

FAST DIRECT READING
To 1", Estimation to 1/10".
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is highly portable. Weight 6 lbs. Height 7" including Metal Case.

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KERN INSTRUMENTS INC.
120 Grand St., White Plains, N.Y.

Additive Makes Kerosene A Cheap Form Lubricant

One gallon of an additive, called "ALOX 436," when added to about 19 gal of kerosene or light petroleum oils will yield a form lubricant that is claimed to be highly effective in preventing bond of concrete to forms. It can be brushed or sprayed on.

According to the manufacturer, the additive produces a form oil that will protect steel form from corrosion, will not discolor concrete, is clean, uniform and light-colored, never becomes rancid and gives the concrete a smooth finish. It is available in 5, 15, 30 and 55-gal. containers as well as tank car or bulk shipments. ALOX CORP., 3968 BUFFALO AVE., NIAGARA FALLS, N. Y.

Corrosion-Resistant Paint Can Be Applied to Wet Metal

A one-coat corrosion-resistant paint to protect metal surfaces can be applied to wet surfaces.

According to the manufacturer, this characteristic of the paint makes it well suited for winter applications and conditions where it is difficult to dry the metal surface. Coastal areas and tropical climates are examples cited.

The shiny, black, elastic coating combines a bituminous alkyd base and a penetrating substance. It is claimed to cut through moisture to surface metal. Termed "RUSTREM—MS", the paint resists dampness, mild industrial acids and fumes, grease, oil, sun rays and extreme temperature changes. It also retards the corrosive effects of salt water and salt-laden air.

Available in black in 1-gal, 5-gal and 55-gal sizes, the substance can be applied by brush, spray or roller. SPECO INC., 7308 ASSOCIATE AVE., CLEVELAND 9, OHIO.

Direct Nailing to Header

An extruded aluminum window frame now has fins at top, bottom and sides that enable it to be directly nailed to the header, sill and sides of the window opening. Fine adjustments and surrounding attachments are eliminated.

There is no glazing problem since the frame uses glass in stock sizes. PANAVIEW DOOR AND WINDOW CO., 13434 RAYMER ST., NORTH HOLLYWOOD, CALIF.

Pocket-Size Dredge for Canal Work

Characterized as a swinging ladder type hydraulic dredge, a new "Canal Dredge" has been developed especially for constructing and maintaining narrow irrigation and drainage canals.

With a hull 11 ft wide, 3 ft deep and 28 ft long, and a dry weight of about 18 tons, the machine can be transported easily to a dredging site by truck, and put into the water by crane. Because of its light weight, the dredge can be self-propelled, utilizing the force of water ejected from the discharge pipe at the stern to move itself forward. The swinging ladder hinged at the bow can move up and down and from side to side.

The craft is also equipped with four spuds to increase maneuverability and stability. Ellicott Machine Corp., Baltimore, Maryland.

Specifically built for construction work

INTERNATIONAL Model S-184 dump truck with new functional, money-saving "S-Line" styling, famous driver-saving Comfo-Vision cab. GVW rating, 22,000 lbs., gross carrying capacity, 15,500 lbs.

All-Truck Built to save you the BIG money!

When you choose INTERNATIONAL Trucks for construction work, you can choose from models *specifically designed* to take the pounding of rugged, heavy hauling.

They're INTERNATIONAL models that have frames, wheels, axles, engines especially engineered to deliver peak performance and longest life in severe off-highway service. All in addition to the fundamental *all-truck* engineering of INTERNATIONAL Trucks – which asks no passenger car engines or components to do a truck job and saves you the BIG money – the over-the-years operating and maintenance money.

INTERNATIONAL LOADSTAR® models are available in conventional and COE designs, 4-wheel and 6-wheel types, from 8,800 to 60,000 pounds GVW. They are part of the world's most complete line of load-spotting vehicles that includes everything from light-duty models with factory-installed dump bodies to 90,000-pound GVW off-highway units.

A truck *exactly right* for your job is in this line-up. See your INTERNATIONAL Truck Dealer or Branch and start saving the BIG money!

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL TRUCKS
Sales leaders *year after year* . . .
24 straight years in the heavy-duty field!
21 straight years in the 6-wheel truck field!

INTERNATIONAL® TRUCKS

All-Truck Built to save you the BIG money!

Motor Trucks • Crawler Tractors • Industrial Power • McCormick® Farm Equipment and Farmall® Tractors

The "ABC's" of Milcor Steel Roof Decks

New "A" Section

The standard of the industry for closed-rib decks. Now 24 in. wide.

New "B" Section

Wide rib distributes metal for greater structural efficiency—gives higher section properties per pound of steel.

New "C" Section

Carries normal roof loads over spans up to 20 feet! Offers freedom of design.

Now! A third type of Milcor Steel Roof Deck

Milcor Type C Roof Deck Provides Great Strength for Long Spans

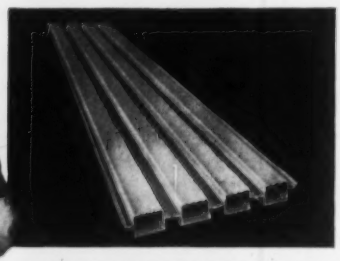
New Milcor Type C Roof Deck carries normal roof loads over spans *up to 20 feet* —requires fewer structural supports and permits greater architectural freedom. Its strength comes from its 4½-inch depth and from its efficient design.

Type C Deck is made 12 inches wide so that two men can handle and place it without special equipment. It is available in 12- to 18-gauge steel — painted with a baked-on enamel primer or TI-CO galvanized.

Interlocking side joints can be mechanically fastened together so that concentrated loads are distributed over two or more panels. Joints may be caulked in factory or field to eliminate the cost of a built-up vapor seal and to increase fire safety.

Now the Milcor family of steel roof decks offer you a wide choice of styles and gauges to meet every job condition efficiently and economically. For additional help in making the best selection, call on your Milcor Sales Engineer. Catalog 620-6 available upon request.

MILCOR® Roof Deck



MILCOR CELLUDECK

is made by welding together sections of "B" and "C" roof deck and flat plates into various combinations, providing cellular deck plates of exceptional strength to carry normal roof loads over great spans. Ask for Catalog No. 270.

M-167A

INLAND STEEL PRODUCTS COMPANY

DEPT. B, 4147 W. BURNHAM ST., MILWAUKEE 1, WIS.

BALTIMORE • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND DALLAS • DETROIT • KANSAS CITY • LOS ANGELES • MILWAUKEE MINNEAPOLIS • NEW YORK • ST. LOUIS

Publications

Crane-excavator—A 4-page bulletin describing specifications, features, operating data and capacities of a new ⅜-cu yd, self-propelled 6-ton power crane and excavator. Called the Model CR-35 Bantam, the machine is one-man operated, has 2-speed independent travel with no-shift forward-reverse design and a 19½-ft outside turning radius. Bul. #CR-501. SCHIELD BANTAM CO., WAVERLY, IOWA.

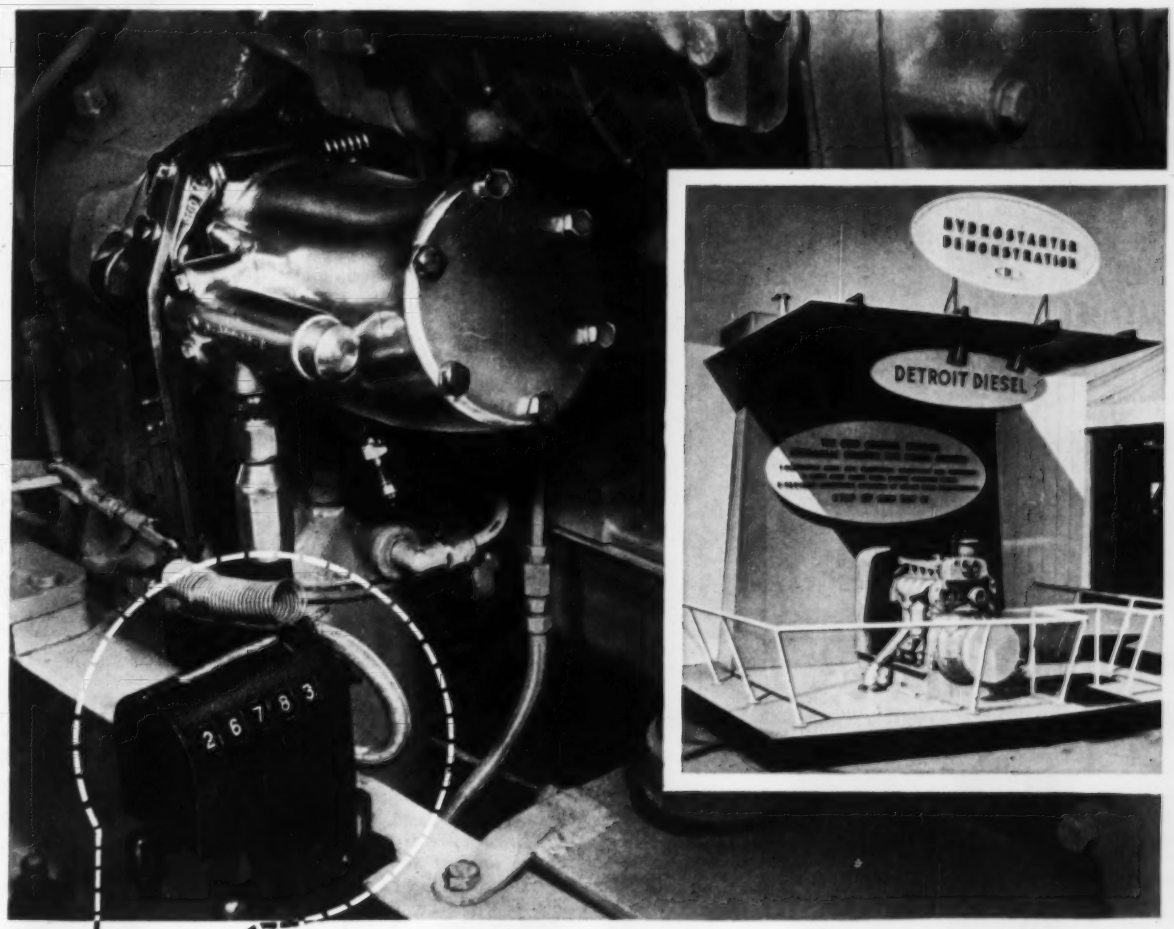
Self-propelled Railroad Crane—Working on or off its own rail car, Koehring's RailAid crane lifts 6.9 tons while on rails, 8.9 tons on the ground. Rail speeds up to 20 mph are claimed in this 8-pg bulletin that describes its operation features. KOEHRING COMPANY, 3026 W. CONCORDIA AVE., MILWAUKEE, WIS.

Tandem Rollers—Bulletin S-70-1155 describes design and performance features of four heavy-duty 2-axle tandem rollers. The 12-page bulletin includes a table giving dimension, weight, specification and compression data for selection of equipment for specific jobs to be done. BUFFALO-SPRINGFIELD ROLLER CO., SPRINGFIELD, OHIO.

One-bag Concrete Mixer—"Kwik-Mix 6-S Dandie Mixers" explains construction features and operating data related to a one-bag mixer. New features incorporated on the 6-S include an automatic syphon type water tank, flow-line discharge chute, multiple V-belt drive and a selective Skip shaker to speed drum charging. KWIK-MIX CO., PORT WASHINGTON, WIS.

Four-wheel drives—New literature released recently includes four 4-page pamphlets describing Napco's Powr-Pak 4-wheel drive units for use with GMC and Chevrolet trucks. Printed in English and Spanish versions, the illustrated literature describes the many duties trucks equipped with Powr-Pak can perform and also lists full specifications of the units. NAPCO INDUSTRIES, INC., MINNEAPOLIS 11, MINNESOTA, U.S.A.

Street and area lighting—Two booklets describe the uses of mercury vapor light sources in street and industrial lighting. Data on 16 types of mercury vapor lamps is presented, providing information on wattage and voltage, lumens, lamp life, burning position, ballasting and fixture types required. SYLVANIA ELECTRIC PRODUCTS, INC., 1740 BROADWAY, NEW YORK 19, N. Y.



26,783 Starts in 26 days at GM Powerama!

(and the total is still growing at the GM Motoramas!)

HERE'S PROOF of the rugged dependability of a General Motors Hydrostarter—the new, low-cost hydraulic starting system now available on all GM Detroit Diesel engines:

> On public demonstration at the GM Powerama, a Hydrostarter started a GM Detroit Diesel 26,783 times in 26 days—an average of more than 1,000 starts per 12-hour day—more than 1 start every minute.

A Hydrostarter gets a GM Detroit Diesel up to starting speeds 80% faster than regular starting systems—costs less to maintain than electric starters—sells for a far lower price than any other non-electric Diesel starter.

And it gives you fast, sure starts—even at sub-zero temperatures, or when your equipment has been standing idle for long periods of time.

Call your GM Diesel Distributor for full details on the GM Hydrostarter—or write direct for more information.

DETROIT DIESEL

Engine Division of General Motors

Single Engines . . . 30 to 300 H.P.
Multiple Units . . . Up to 893 H.P.

America's Largest Builder of Diesel Engines

THIS IS IT!

F/S MODEL 5172

HIGH PRECISION— LOW COST—

NEW

AUTOMATIC LEVEL

Now you can get a reliable precision instrument which actually automatically levels itself, quickly, simply, easily—no complicated time-wasting adjustments . . . at an astonishingly low price!

• THE AUTOMATIC LEVEL F/S 5172 OFFERS YOU

24X Periscopic telescope containing a "pendulum-principle" device which automatically produces and maintains a horizontal line of sight.

Direct view of the spherical bubble through the telescope eyepiece, allowing constant check on the bubble centering while reading rod.

• THE AUTOMATIC LEVEL F/S 5172 GIVES YOU PRECISION ACCURACY

±0.028 ft./mile if used with regular base; ±0.010 ft./mile if used with special up-down movable base (micrometer Mod. 4180) graduated to 1/1,000 ft. or to 1/10 mm.

• THE AUTOMATIC LEVEL F/S 5172 COSTS YOU ONLY

$350 including adjustable leg tripod

$90 for the optional micrometer Mod. 4180

GUARANTEED 18 MONTHS
FULL SERVICING BY FACTORY SPECIALISTS

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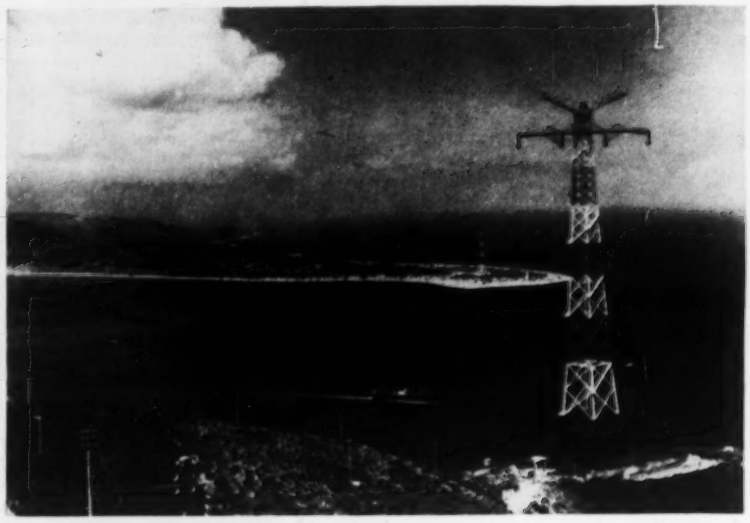


Ship gives idea of size as . . .

World's Longest Cable Spans 12,000 Ft

Much needed electric power is now being fed to Sicily through cables spanning the Messina Straits off Italy's southern tip. Gigantic lattice towers were required to support the cables over an 11,980-ft span—the longest in the world.

The towers are 735 ft high and weigh 500 tons. They are designed to withstand winds up to 93 mph, a constant cable pull of 27½ tons maintained by counterweights, and earthquakes up to 10 deg Mercalli.

The tower on the Italian side is founded in good rock, but the island tower rests on a sandbank. Its foundation consists of 30-ft square concrete piers built 66 ft into the sandbank. They support a cross-shaped base over a 115x115-ft area that contains 56,000 cu yd of concrete and 540 tons of reinforcing steel.

Horizontal cross-arms measure no less than 246 ft from end to end and carry four 1.1-in.-dia steel-aluminum stranded cables. Extensions above the cross-arms are for future conductors which will then allow two triangular 3-wire systems, with wires a minimum of 82 ft apart.

Initial transmission capacity through three of the four wires hung from the cross-arms is 50,000 kw at 150 kv. When voltage is increased to 220 kv, capacity will be 150,000 kw. When the extension piece wires are installed, capacity at 220 kv will be 300,000 kw.

Argentine-Uruguay Project Revived

Plans for a $1 billion joint Argentine-Uruguayan hydroelectric plant are being revived now that Peron has fallen and the neighboring nations are friends again. The project calls for construction of twin power stations at Salto Grande, one on either side of the Uruguay River, which forms the boundary between the two countries. Each will have a potential of 700,000 kw.

While thrifty Uruguay is looking ahead, and does not envisage total consumption of the plant's output until 1970, power hungry Argentina could today consume every kilowatt of the 700,000 her plant will produce, and more besides. The largest consumers of the Salto Grande plant's power, on this side of the river, will be Rosario, Santa Fe, La Plata and Greater Buenos Aires. The latter city is now working with a power deficit estimated at 300,000 kw, at least.

Preliminary studies of the project have been made at intervals beginning in 1907. Through the years, Uruguay continued with geological and hydrographic studies and completed comprehensive blueprints of the works.

Either the Export-Import Bank or the International Bank for Reconstruction and Development will be asked to finance the project.

Men and Jobs

C. S. Proctor

Heads Consultants

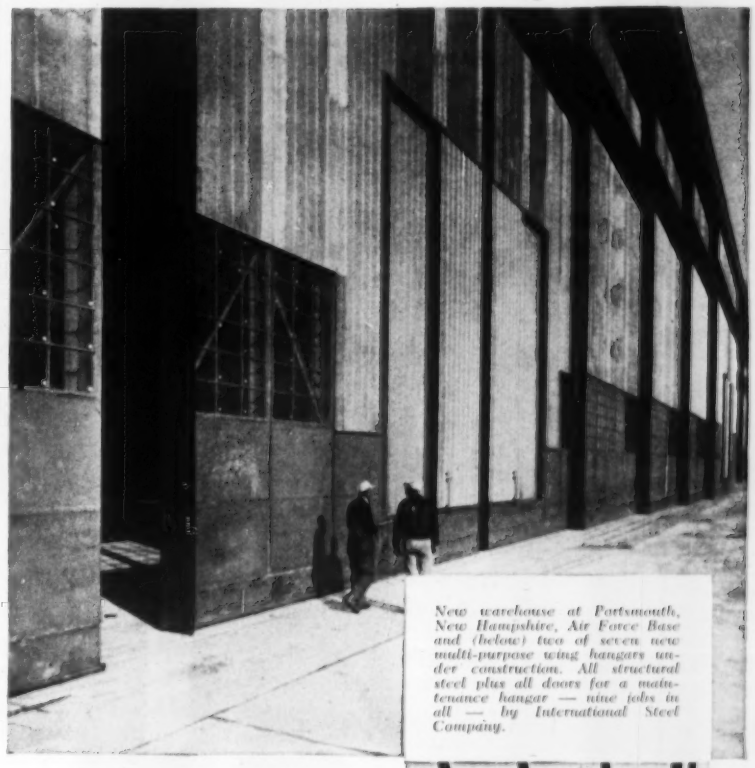
Carlton S. Proctor elected to A.I.C.E. presidency

Carlton S. Proctor, partner in the New York consulting firm of Moran, Proctor, Mueser & Rutledge has been elected president of the American Institute of Consulting Engineers.

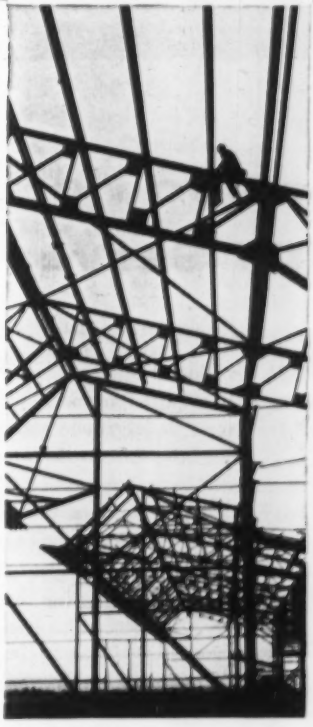
A past president of the American Society of Civil Engineers, Mr. Proctor has played a leading role in national engineering and construction affairs for many years. In the 30's he was a director and vice president of the Construction League of the U. S. From 1940 to 42 he was chairman of the Engineers National Defense Board, forerunner of Engineers Joint Council, and has been active in Council affairs since. Following the war he was chairman of an EJC committee, which reported to the U. S. Departments of State, War and Navy on plans for the industrial disarmament of both Germany and Japan. He has been a director of the New York Building Congress, and in 1949 was president of The Moles. He has been chairman of the Bronxville N. Y. Planning Commission and president of the Princeton Engineering Association.

During the war as a colonel in the Corps of Engineers, Mr. Proctor commanded the 334th Special Service Regiment, and later was in command of the engineer district in Iran, where the Persian Gulf Command set up the port and transportation facilities for moving military supplies to Russia.

Mr. Proctor's firm, which specializes in foundation engineering, has been consultant on the design of many notable structures both in the U. S. and abroad. Countries in which the work



New warehouse at Portsmouth, New Hampshire, Air Force Base and (below) two of seven new multi-purpose wing hangars under construction. All structural steel plus all doors for a maintenance hangar — nine jobs in all — by International Steel Company.



up
One ~~Down~~...
and 8 to go

When it comes to aviation or industrial buildings and doors that add to their efficiency . . . particularly multi-unit projects that involve unusual problems . . . more and more contractors, architects, and engineers are calling on International Steel. They have found, as will you, that International's *fully integrated* planning-engineering - fabricating service is sound "profits-insurance" — regardless of geographical factors or job requirements. Write for International Steel Facilities Guide.

See Complete Catalogs in Sweet's Industrial Construction Files No. 2c and 7a

INTERNATIONAL SERVICE

INTERNATIONAL STEEL COMPANY
2056 EDGAR STREET • EVANSVILLE 7, INDIANA

1930

This photo, taken 26 years ago, shows 8-inch-diameter Armco Perforated Pipe being installed to correct a soft spot in the road.

Same Armco Perforated Pipe as it appears today (coarse gravel filter removed to show condition). Pipe is still in good shape.

1956

Armco Perforated Pipe Still Serves Highway After 26 Years

In 1930, a section of Route 122 in Ohio had a subdrainage problem that required repeated pavement repair. To remove the excess underground water and correct the condition permanently, Armco Perforated Subdrainage Pipe was installed. The water emptied into the roadside ditch.

Today, the pipe is still operating efficiently. The outlet has been covered with a coarse gravel filter to allow water to empty into the ditch, and yet eliminate any possibility of a hazard for vehicles leaving the road.

Efficiency Also Important

Primary purpose of perforated pipe is to remove excessive water in the subgrade. Armco Perforated Pipe does this job efficiently. Water seeps in through holes drilled in the side of the pipe invert, and runs out to ditches or drainage conduits.

Armco Perforated Pipe is supplied in 20-foot lengths, and bolted coupling bands make an integral structure. There is no danger of breaking, cracking or disjointing. For more data, write us. Armco Drainage & Metal Products, Inc., 3996 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO PERFORATED PIPE

ARMCO

H. C. Goodrich

Elected Vice President

The Rust Engineering Co., Pittsburgh, Penn. has named Henry C. Goodrich as vice president in charge of sales and estimates in its Birmingham, Ala. office. A civil engineering graduate of the University of Tennessee, Goodrich has been with the firm for the last nine years, first as a structural engineer and later as project manager for a number of major construction projects.

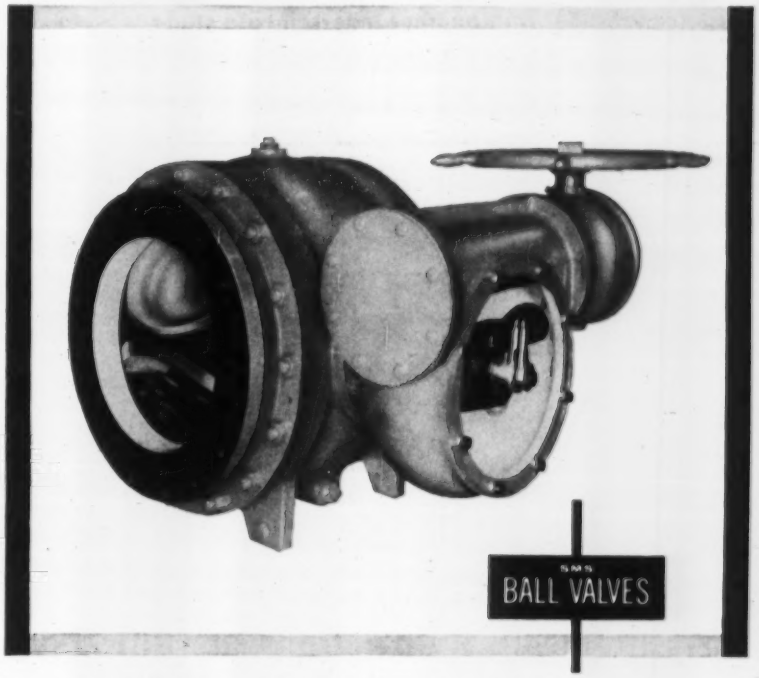
has been located include Brazil, Argentina, Russia, Cyprus, Venezuela and Canada. In the U. S., the firm has been connected with many important buildings, port facilities and bridges, the latter including George Washington, Triborough and Bronx-Whitestone at New York, San Francisco-Oakland, New Orleans, Detroit Ambassador, Vicksburg, and Philadelphia-Camden.

Ferguson Named An Officer Of F. H. McGraw & Company

A. K. Ferguson, who became president of The H. K. Ferguson Company in 1945, has been elected a vice president of F. H. McGraw & Company, Hartford, Conn., engineering and construction firm.

Active in the construction field for more than 30 years, Ferguson was formerly an officer in the Walter Kidde Construction Company. He has recently been engaged in engineering studies for railroads and mining interests.

A graduate of Ohio Wesleyan University, Ferguson started his career as a water boy on a construction project



FLOW ITSELF HELPS MAKE SMS BALL VALVES EASY TO CLOSE

Flow velocity actually assists the closing operation of SMS Ball Valves. With the hydraulic action boosted by the powerful leverage of the simple link and lever mechanism (visible through the lucite cover of the demonstration model above), the valve is remarkably easy to close. The wedging action of the metal-to-metal seats assures drop-tight closure.

In the open position, the valve is like a straight length of pipe. Pressure drop and turbulence are kept to a minimum, resulting in lower pumping costs and longer valve life.

The high quality and performance characteristics of SMS valves are guaranteed by over 75 years of research and engineering. For detailed information about our complete line of Ball Valves, Rotovalves and Butterfly Valves, see your local representative, or write to the S. Morgan Smith Company, York, Pennsylvania.

HYDRAULIC TURBINES · PUMPS · GATES & HOISTS · TRASH RAKES · ACCESSORIES

HYDRODYNAMICS

ROTOVALVES · BALL VALVES · BUTTERFLY VALVES · FREE-DISCHARGE VALVES · CONTROLLABLE-PITCH SHIP PROPELLERS

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED • TORONTO

Sundstrand . . . another Ingersoll case study

New Ingersoll aluminum roof deck at Sundstrand Machine Tool Co; Olson & Urbain, Architects.

How Ingersoll's new idea in roof deck ended maintenance painting at Sundstrand

Funtional in every detail, Sundstrand Machine Tool Company's new plant at Belvidere (Ill.) embodies many new ideas. One of them—its new Ingersoll Roof Deck—has already earned Sundstrand a "Significant Plant" citation from FACTORY magazine.

The ceiling of the 30,000 sq. ft. plant is 55 ft. high. For this reason it was imperative that the structural roof system used be exceptionally strong, require minimum maintenance.

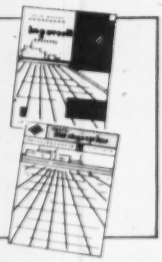
Unequaled strength

Given these stringent requirements, Ingersoll Aluminum Roof Deck was the only logical specification. It surpasses conventional systems in strength, never requires painting. And an added benefit is its thermal insulating value. Reflects radiant heat to keep the plant measurably cooler in summer!

A new concept in engineering, Ingersoll Roof Deck is a system of full-floating panels that clip to galvanized steel sub-purlins. Erection is quick, easy, positive. And besides eliminating the need for painting, Ingersoll's aluminum panels provide gleaming beauty, improve plant lighting.

FREE

Complete case study on the Ingersoll installation at Sundstrand is available on request. Send now for your free copy.



In Aluminum or Porcelain Enamel

Ingersoll Roof Deck is available with panels of either aluminum or porcelain enameled steel. Porcelain provides all the benefits of aluminum, plus full protection against excessive moisture and other corrosive elements. Whether in aluminum or in porcelain enameled steel, Ingersoll Roof Deck may be just the product for your next job. Why not investigate today? Send for free brochure, along with complete case study of the award-winning Sundstrand installation.

Ingersoll
ROOF DECK

603

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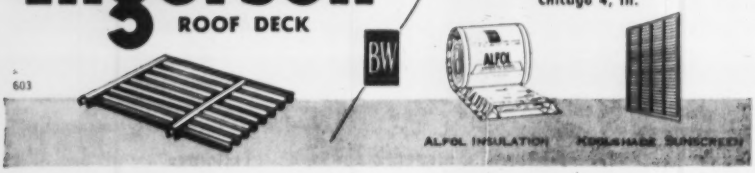
A subsidiary of Borg-Warner Corp.
310 S. Michigan Ave., Dept. RD-13
Chicago 4, Ill.



. . . Men and Jobs

A. K. Ferguson

in 1923. He worked on a number of multi-million dollar military projects during World War II and became head of the Ferguson firm, following the death of his father.

Men and Jobs Briefs . . .

• **Associations**—The Maryland section of ASCE elects **W. Watters Pagon** as president . . . **Gordon Sweet** of Colorado Springs is elected president of the Colorado chapter and **Robert I. Upshur** of Columbia, S. C. is the new president of the South Carolina chapter of the American Institute of Architects.

Colorado Contractors Assn., Inc., elects **Edwin W. Vandervort** of Northwestern Engineering Co. as president . . . **Dean Plumb** of D&H Contractors, Inc. of Aurora, is elected president of the Light-Heavy Contractors Assn. of Colorado, Inc. . . . The Montgomery County Builders Assn., Dayton, Ohio, installs **Orville M. Southard** as president.

• **Careers**—City traffic engineer of Sacramento, Calif., **D. Jackson Faustman** resigns effective March 1, to establish his own consulting engineering firm . . . **William Goldman,** former Youngstown, Ohio, city engineer, succeeds **William Smith,** who resigned as city engineer of Sharon, Pa.

• **Business**—H. K. Ferguson Co., Cleveland, Ohio, opens its new division office in Atlanta, Ga., with **Cephas P. Quattlebaum** in charge . . . **James A. Polzar** is elected president of the Capitol Erecting Co., a Milwaukee, Wis., steel erecting firm.

Gilbane lays out new atomic vistas for Tracerlab with BERGER TRANSITS

"Tracerlab, Inc.", suggests a Reader's Digest article, "may turn out to be the General Motors of the atomic era". One of America's leading pioneers of instruments that detect the path of radioactive isotopes, Tracerlab has been making news on medical and industrial fronts since the end of World War II.

Naturally, Tracerlab's big new plant in Waltham, Mass., called for the highest standards of accuracy in every stage of construction. That's why Gilbane Building Company engineers saw it as another job for the BERGER 6¼" Bronze Transit—just as they did for so many other Gilbane projects where on-the-button surveying was a "must".

Results? Pin-point precision up and down the line of sight—from the initial excavating . . . to setting the concrete forms . . . leveling the foundation . . . plumbing the steel and setting room and floor deflection allowances to close tolerances.

BERGER is on the job for many other major Gilbane projects. Among the most recent: the huge new Wyman-Gordon plant at North Grafton, Mass., and the new Carling Brewery in Natick, Mass.

For clarity of optics, ease of leveling up and all-around dependability under even the most adverse conditions, leading engineers and construction men buy BERGER.

Put yourself behind a BERGER—and see why.

C. L. BERGER & SONS, INC., 45 Williams St., Boston 19, Mass.

Write for a copy of "ACCURACY IN ACTION"

THE BEST IN SIGHT IS

BERGER

ENGINEERING AND SURVEYING INSTRUMENTS . . . SINCE 1879

• *Highest speed*

• *Simplest operation in its class*

New, low-cost Streamliner 400

Here is whiteprinting made easier than ever in the new low-cost Ozalid Streamliner 400. Compact, rugged, easy-to-operate . . . it delivers higher speed, greater volume, more "wanted" features than any other printmaker in its class.

Prints and develops at speeds up to 24 feet per minute . . . handles prints up to 42 inches wide. High-intensity mercury vapor lamp provides complete, uniform exposure. Patented evaporator and thermostatically controlled heater rod assure uniform print development.

Synchronized printing and developing sections permit continuous operation with roll stock. Short travel provides rapid processing of cut sheets. Automatic controls regulate temperature and ammonia flow. New electronic drive provides instantaneous speed changes with complete accuracy—simple enough for the novice operator!

Smartly styled, compact, the Streamliner 400 stands just 49″ high, 63″ wide, and 31″ deep, and is finished in durable, ripple-gray baked enamel. One-piece enclosed base, welded-steel body and tubular support assure exceptional rigidity and permanent alignment.

INSTANT COLOR CHANGE—You change print color instantly, simply by using different Ozalid papers. No messy fluid changes or time-consuming clean-up required on any Ozalid model.

LOOK FOR IT!

Ask your nearest Ozalid distributor to demonstrate the low-cost, high-volume Streamliner 400. His number's in the phone book, or write Ozalid, Dept.N-2,Johnson City, N. Y., for descriptive brochure.

OZALID
DIRECT COPY COPY SYSTEMS

Got A Printmaking Problem?
Call your local Ozalid representative. His expert advice is yours for the asking—whether or not you now own or plan to buy Ozalid equipment.

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In Canada: Hughes Owens Co., Ltd., Montreal

Obituaries

A. Burton Cohen, 73, consulting engineer on concrete bridge construction and elimination of railroad grade crossings, died in New York City Feb. 11. In recent years, he had designed 17 bridges on the New York Thruway and 11 on the Connecticut Turnpike. The Delaware, Lackawanna and Western Railroad in 1910 put Cohen in charge of a 10-year program that involved elimination of 200 grade crossings in suburban areas of New Jersey. Later he was engaged in planning the removal of 100 grade crossings in Nassau County, N. Y. He was responsible for design of the Tunkhannock Creek Viaduct near Scranton, Pa., one of the world's largest reinforced concrete railroad structures. In 1927, the American Concrete Institute awarded Cohen a gold medal for his contributions to bridge design. A graduate of Purdue University, he was a member of several engineering societies and author of many technical papers.

Rudolf Unfug, 65, architect-engineer for the Rust Engineering Co. for 36 years, died Feb. 1 in Washington, D. C. Born and educated in Germany, Unfug was recognized as a specialist in refractory brickwork engineering. He joined the Rust company's Washington office in 1920 and in 1935 went to their Pittsburgh headquarters, returning to Washington in 1946.

Arthur H. Adams, 47, inspection chief for the Buffalo District, Army Engineers, died Jan. 28. He had formerly been associated with Bethlehem Steel Co.

Archibald T. B. Somerville, 89 former city engineer of Ashland, Ky., died recently. Before going to Ashland, he had been head of the drafting department of American Bridge Co., Toledo, Ohio plant. The Scioto River Bridge at Portsmouth, Ohio, was among Somerville's many bridge projects. He was a graduate of Lafayette College.

James N. Kennedy, 83, retired structural engineer with Day and Zimmermann, Philadelphia, died Feb. 5. During his 40-year association with the company, Kennedy worked on engineering projects throughout the nation and abroad.

Frank M. Hodge, 51, Rowan County, N. C., surveyor, died Feb. 4. Before assuming the county post, he was with J. N. Pease Co. of Charlotte, N. C.

GRADUATE SCHOOL OF PUBLIC HEALTH, University of Pittsburgh, Pittsburgh, Pa.
Eggers and Higgins, Architects
Weiskopf and Pickworth, Structural Engineers
Mellon-Stuart Company, General Contractor

New-Design Steel Joists speeded erection of this handsome 8-story building

USS AMBRIDGE Steel Joists for floor and roof supports contributed materially to the speedy erection of the University of Pittsburgh's new Graduate School of Public Health building.

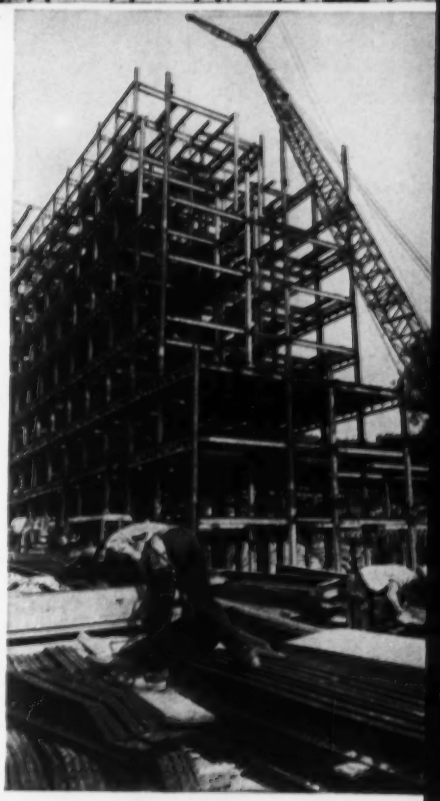
This modern 8-story structure is 64'-1" wide x 297'-8" long, with two wings, one 26'-5" x 60'-0", and one 36'-4" x 70'-0". The total weight of structural steel, including 122 tons of new-design steel joists, is 1,141 tons, all of which was fabricated and erected by American Bridge.

USS AMBRIDGE standard Steel Joists provide rigid, economical and lightweight construction suitable for any type of floor, roof and ceiling. The underslung and open web design provides for maximum head room and allows passage of pipes, ducts and conduits in any direction.

In floor construction, the ease and simplicity of handling this new-design steel joist reduces installation time to a minimum and permits other trades to begin their work promptly. And, for roof construction, AMBRIDGE Steel Joists cut the time required to put your structure under cover.

AMBRIDGE Steel Joists—standard and longspan — are fabricated and assembled on a modern production line basis to assure you a *better* product in *faster* time, thus enabling you to build an economical structure without interruption of your schedule. *Your joists are ready when you are ready for them.*

ASK FOR FREE BOOKLET: For detailed information about the time-and-money-saving advantages of using USS AMBRIDGE Steel Joists on your next job, get in touch with our nearest Contracting Office, or write direct to Pittsburgh, for a free copy of our new 36-page catalog. Contains complete design information. It is the only complete steel joists catalog with design information for spans up to 120 feet. Ask for your copy today or see our catalog in Sweet's Files.



INTERESTING MOTION PICTURES AVAILABLE—"Building for the Nations" and "The Suspension Bridge," two entertaining and educational films, are now available without charge to business, fraternal and civic organizations, churches, schools and colleges. Write to Pittsburgh office for bookings.

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMBRIDGE STEEL JOISTS

USS

UNITED STATES STEEL

Where parts must be **EXTRA TOUGH**

. . . specify AMSCO® MANGANESE STEEL

Digging! Crushing! Handling! Amsco manganese steel parts work up to 10 times longer under punishment . . . because manganese steel can easily absorb heavy impact and abrasion. Hard work toughens the metal . . . it work hardens to as high as 550 Brinell. The pounding, grating action of rock and ore only polishes manganese steel.

To get maximum life out of your equipment, specify Amsco manganese steel parts from the manufacturer.

DIGGING — backhoe buckets • dippers and parts • repointers • dragline buckets and parts • dragline chain • sheaves • pinions • crawler shoes

CRUSHING — concaves • mantles • jaw plates • mill liners • hammers

HANDLING — bulldozer blades • tractor rollers, idlers • sprockets, grouser bars • truck beds • grizzle parts • ore car wheels and liners • sheaves, gears, pinions

Amsco also produces other alloy steels with maximum wear resistance under particular conditions of service . . . and a complete line of hardfacing equipment, both rods and machines.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

Bids Asked—Low Bidders—Contracts Awarded—First Section—

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J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 5 Connecticut
STREETS AND ROADS
March 5 Connecticut March 6 Massachusetts

▲† **Maine**—AAA FACILITIES—BA 3/1—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., Special AAA Facilities, Limestone, Caswell, Caribou and Connor. $4,000,000. Plans deposit $50, refundable. Spector & Montgomery, Falls Church, Va., archts.-engrs. Crandall Eng. Co., 261 Franklin St., Boston, Mass., and Leon Chatelain Jr., 1632 K St. N.W., Wash., D. C., engrs. CD 12/15.

▲† **R. I., Davisville**—MARGINAL WHARF—BA 3/14—First Naval Dist., 495 Summer St., Boston, Mass., marginal wharf, Naval Construction Battalion Center, NOY 89974, Spec. 47524. $4,000,000. Plans deposit $30. Extended date. Jenks & Ballou, Industrial Trust Bldg., Providence, engrs. CD 2/1.

BUILDINGS—BA

▲ **Mass., Dracut**—SCHOOL—BA 2/29—Town, Paul H. Phaneuf, Supt. Schools, constr. Junior-Senior High School Lakeview Ave. $2,000,000. Plans deposit $100, refundable. Extended date. Hugh A. Stubbins Assoc., 78 Mt. Auburn St., Cambridge, archts. CD 1/24.

▲ **Mass., Sharon**—SCHOOL—BA 3/8—Town, High School Bldg. Comn., Richard Hosmer, chn., c/o Supt. Schools, South Main St., high school, Pond St. $1,500,000. Plans deposit $75, refundable. Anderson-Nichols & Co., 150 Causeway St., Boston, engrs.-archts.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
M. **DeMatteo Constr. Co.**, 200 Hancock St., Quincy, Mass. CA $4,610,396, est. $5,119,840. Sect. 1, Southeast Expressway Neponset Circle across marsh and Neponset River and Granite Ave., Dorchester. Maurice A. Reidy & Clarkeson Eng. Co., 285 Columbus Ave., Boston, Mass., engrs. Bids Jan. 24, awarded Feb. 7. CD 1/26, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Charles **Capone Constr. Co., Inc.**, Roslindale, Mass. LB $2,827,737. Sect. 4, hy. Southeast Expressway, Braintree. Bids Feb. 14. CD 1/5.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
C. J. **Maney Co., Inc.**, 173 Bedford St., Lexington, Mass. LB $2,932,058. IN 349 (2) Contr. No. 5, Northeast Expressway, Revere. Bids Feb. 14. CD 2/6.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,
Conn.—**Cayuga Foundation Corp.**, 30 Vesey St., New York, N. Y., LB, $7,281,878, Proj. 310-01, Proj. 310-01, c. conc. 8,482 lin. ft., incl. ramps, frontage roads, grade separation structures at State St. Exten., Fairfield, Hancock, Howard and Wordin Aves., incl. substructures for viaducts at Burr Rd., Cherry Rd. and South Ave., Fairfield and Bridgeport;
Conn.—**Slattery Contg. Co., Inc.**, 47-36 54 Road, Maspeth, N. Y., LB, $7,336,147. Proj. 302-02, c. conc. 13,787 lin. ft., incl. 8 grade separation structures at River Ave., James St., Delavan, Ritch Aves., Field Point Rd., Shore Rd., Arch St. and Steamboat Rd., 2 drainage structures at Horseneck Brook in Greenwich Harbor on Field Point Rd., both Connecticut Turnpike, Greenwich;
Conn.—**Fred Onuparik**, 501 Broad St., New London, Conn., LB, $397,450. Proj. 112-61, b. conc. 10,335 lin. ft. on relocation of Route 165, Norwich and Preston;
Conn.—**Charter Oak Constr. Co., Inc.**, 525 Main St., Hartford, Conn., LB, $203,941. Proj. 104-87, bit. macad. pavement 2,050 lin. ft. relocation of Route 156, incl. single span welded girder composite section bridge, 117.56 ft. long with rein.-con. deck over N. Y., N. H. & H. R.R., Old Lyme. Bids Feb. 14. CD 1/26.

▲ **CONNECTICUT**—State Hy. Dpt., State Office Bldg., Hartford,
A. S. **Wikstrom, Inc.**, Mottville, Skaneateles, N. Y., CA $5,726,917, Proj. 311-01, substructure, Bridgeport Harbor Bridge, Bridgeport. Bids Jan. 16. CD 1/18, under LB.

BUILDINGS—LB & CA

▲ **Paul Tishman Co., Inc.**, finance and construct 21 E. 70 St., New York, N. Y. CA $6,813,996. Family HOUSING, 505 units, Otis Air Force Base, FALMOUTH, MASS. Purch. & Contg. Office, Otis Air Force Base, Falmouth, Mass. CD 2/2, under LB.

▲ **Green Manor Estates**, 681 Parker St., Manchester, Conn., Owner Builds. $2,998,000. 200 HOUSE DEVELOPMENT, Forbes Manor, EAST HARTFORD, CONN. Arnold Lawrence, 19 Bliss St., Manchester, Conn., archt.

▲ **Fusco-Amatruda Co.**, 57 Amity Rd., New Haven, Conn. Owner Builds. $4,000,000. 30-store, steel, brick, cinder block SHOPPING CENTER, Chase Ave., WATERBURY, CONN. Rossetti & Di Corcia, 80 Elizabeth St., Hartford, Conn., archts. John P. Legnos, 1078 Main St., Newington, Conn., engr.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 7 Delaware March 8 New Jersey, New York

BUILDINGS—BA

▲ **N. Y., New York**—RECEPTION—BA 3/8—Henry A. Cohen, dir. Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg. Albany, reception bldg. at Manhattan State Hospital, Ward Island. Plans deposit $50 general constr., $40 each for heating, sanitary and electric, $30 elevator, $20 food service equip. CD 3/16.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany,
N. Y.—**Depew Paving Co., Inc.**, 161 Woodlawn Ave., Depew, N. Y. CA $3,591,778. constr. west of Hamburg and 8.03 mi. portion of four lane divided Erie Sect. of State Thruway, starting at Evans Center-Eden Rd. and exten. northeastward on east side of Rte. 20 to about 1,000 ft. southwest of Camp Rd. (Rte. 75) Erie Co.;
N. Y.—**S. J. Groves & Sons Co.**, Empire Bldg., Syracuse, N. Y. CA $1,047,309 (4 bidders) traffic interchange facilities between Erie Sect. of State Thruway and Rtes. 5 and 20 in Irving, Chautauqua Co. CD 12/5, under LB.

▲ **Ralph Tomasetti & Co.**, 1163 58 St., Brooklyn 19, N. Y. LB $1,863,587. (6 bidders) combined replacement relief sewer in Autumn Ave. from Pitkin to Sutter Aves., incl. new siphon chamber; combined sewer in Autumn Ave. from Sutter to Fairfield Aves., grading Autumn Ave. from Fairfield to Wortman Aves.; from Stanley to Loring Aves. and from Linden Blvd. to Blake Ave. and regrading Autumn Ave. from Wortman to Stanley Aves., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn, N. Y. Bids Feb. 7. CD 1/20.

▲ **Tully & DiNapoli, Inc.**, 127-50 Northern Blvd., Flushing, N. Y. CA $3,746,000. constr. hys., bridges, utilities in the 655-acre central terminal area at New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 1/19, under LB.

▲ **Tufano Constr. Corp.**, 32-17 Lawrence St., Flushing, N. Y. CA $2,649,000. constr. 5 mi. taxiway to complete dual peripheral taxiway system linking runways and taxiways to present ramp area, New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 1/26, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Latrobe Road Constr., Inc., Box 150, Latrobe, Pa. CA $5,381,623. constr. 8,034 ft. separated hy. of reinforced-con. 4 plate girder and T-beam bridges, substructures of 3 bridges T.R. 8-28, Shaler Twp., Etna and Sharpsburg Boros, Allegheny Co. Bids Jan. 27, awarded Feb. 10. CD 2/1, under LB.

▲ **Lycoming Constr. Co.**, 127 Susquehanna St., Williamsport, Pa. LB $4,725,315. constr. Penn Forest Dam and reservoir and appurtenant work in connection with Wild Creek Gravity Water supply system, BETHLEHEM, PA. Bethlehem Auth., 6 W. Broad St., Bethlehem, Pa. Bids Feb. 2. CD 12/28.

▲ **Nager Electric Co. & Keystone Eng. Corp.**, 426 Broadway, Brooklyn, N. Y. CA $2,245,000. Contr. P.T. 115, completion of electric installation for tunnel structures, Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Bids Jan. 5, awarded Jan. 11. CD 1/16, under LB.

BUILDINGS—LB & CA

▲ **Lake Erie Engineering Corp.**, Riverview and Woodward Aves., Kenmore, N. Y. CA Est. $3,000,000-$6,000,000. 2,000 tons pressure press for high alloy tool steels and special products, DUNKIRK, N. Y. Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh, Pa. CD 8/25.

▲ **George Hyman Constr. Co.**, 1010 Vermont Ave. N.W. Wash., D. C., LB $2,354,000. LIBRARY for University of Maryland, COLLEGE PARK, MD. State, Dpt. P. Imprvts. 506 Park Ave., Baltimore 1, Md. Bids Feb. 14. CD 1/26.

▲ **Cameo At Westbury Homes**, c/o Stanley Klein, archts., 893-1 161 St., Jamaica, N. Y. Owner Builds. $2,000,000. 78 HOUSES on tract on Valentine Rd., south of Old Country Rd., WESTBURY, N. Y.

▲ **George Theodore & Son**, 5 S. Washington Ave., Margate, N. J., CA, $8,000,000, RESIDENTIAL DEVELOPMENT, Harding Highway, MAYS LANDING, N. J. Owner c/o Budnick Brothers, Pleasantville, N. J.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 13 Tennessee
STREETS AND ROADS
February 29, March 21 Louisiana March 13 Tennessee

BUILDINGS—BA

▲ **Ky., Ford**—PLANT—BA 3/6—East Kentucky Rural Electric Co-operative, Winchester, Constr. 109, superstructure for steam generating plant. Total est. $30,000,000. Plans deposit $10. New bid date. Burns & McDonnell Eng. Co., P.O. Box 7088, Kansas City 2, Mo., engr. CD 2/3.

▲ **Ky., Shively**—HOSPITAL, etc.—BA 3/6—St. Mary & Elizabeth Hospital, 1567 S. 12 St., Louisville, 6 story, 3-wings hospital and nurses' home, off Dixie Hy. $3,200,000. Thos. J. Nolan & Sons, Kentucky Home Life Bldg., Louisville, engrs.-archts. CD 8/16, Ky., Louisville.

▲ **La., Lake Charles**—HOUSING—BA 3/15—U. S. Eng., P. O. Box 1229, Galveston, Tex., construct and finance family housing, Lake Charles Air Force Base, ENG-41-243-56-45. $1,000,000-$5,000,000. CD 6/2, under Airports.

▲ **S. C., Irmo**—STEAM PLANT—BA About 5/1—South Carolina Electric & Gas Co., 328 Main St., Columbia, (selected list of bidders) Unit 1, steam plant on Lake Murray. Total est. $19,000,000. Gilbert Assocs. Inc., 61 Broadway, New York 6, N. Y., engr. CD 11/29.

HEAVY CONSTRUCTION—LB & CA

▲ **McWilliams Dredging Co.**, 903 S. Jefferson Davis Parkway, New Orleans, La. CA $3,037,560. installing hydraulic levee fill beginning at south point running

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

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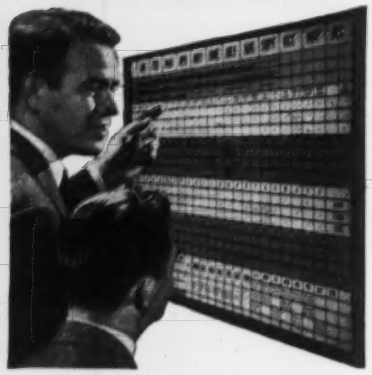

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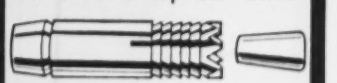

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Dept. 40, Michigan City, Indiana

southerly to junction with Intracoastal Canal, thence to Michoud, NEW ORLEANS, LA. Bd. Levee Comm., 200 Civil Courts Bldg., New Orleans, La. CD 1/20, under LB.

▲ **TENNESSEE**—State Hy. Dpt., Nashville,

Tenn.—**Wesco Paving Co.**, Airport Rd., Chattanooga, Tenn. CA **$903,768**, bit. materials resurf. 18.7 mi. State Rte. 2, Proj. No. SP-1166-A, Marion and Hamilton Counties;

Tenn.—**Southern States Paving Co.**, 900 44th Ave. N., Nashville, Tenn., CA **$519,045**, bit. materials, wid'n. and resurf. 21.36 mi. State Rte. 6, Proj. SP-1163-A, Lawrence Co.;

Tenn.—**Ralph E. Mills Co.**, 410 Ann St., Frankfort, Ky., CA **$1,555,894**, bit. materials paving, constr. sidewalks, concrete parking strips with curbs, storm sewerage sys., widen 3 bridges 7.982 mi. State Rte. 9 Proj. F-009-2-(2); Knox Co.;

Tenn.—**J. H. Hood & Son**, Bellbuckle, Tenn., CA **$161,056**, crushed stone surf., constr. 3 bridges 4.537 mi. sect. Secondary Rte. 4334, Proj. No. S-4334-(1), Fentress and Pickett Counties. Grand total $3,139,763. Bids Jan. 24. CD 1/30, under LB.

BUILDINGS—LB & CA

▲ **Southeastern Constr. Co.**, 301 W. 2 St., Charlotte, N. C. CA Est. **$3,000,000.** lumber processing PLANT, incl. 1 story plant, power plant, air drying yards and dry kilns, on 30 acre site, MERIDIAN, MISS. Kroehler Mfg. Co.; Naperville, Ill. Neild-Somdal-Assoc., 960 Jordan St., Shreveport, La., archts. Awarded Feb. 9. CD 1/24/55.

▲ **R. F. Farnsworth & Co., Inc.**, 1515 S. Salcedo St., New Orleans, La. CA **$1,698,500.** 9 story, rein.-con., steel Jefferson Parish COURT HOUSE, GRETNA, LA. Jefferson Parish Police Jury, Gretna, La. Bids Jan. 18, awarded Feb. 8. CD 1/25, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 6 Ohio

STREETS AND ROADS

February 28 Wisconsin March 6 Ohio

BUILDINGS—SLC

▲ **Ind., New Albany**—POWER HOUSE—Public Service Co. of Indiana, 1100 Main St., Plainfield, soon lets contract substructure for power house, Total est. $47,000,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., engrs. CD 11/9/53.

HEAVY CONSTRUCTION—LB & CA

▲ **Hunkin-Conkey Constr. Co.**, 1740 E. 12 St., Cleveland 14, O. CA **$3,824,706**, est. $3,500,000. administration and chemical bldg., other facilities, Clague Rd. Filtration Plant, CLEVELAND, O. City, Dpt. P. Utilities, Frank J. Schwemler, comm., City Hall, Cleveland 14, O. Bids Jan. 13, awarded Feb. 8. CD 1/19, under LB.

▲ **R. S. Ursprung Co.**, Hanna Bldg. Annex, Cleveland 15, O. CA Est. **$3,250,000.** two hangars, Cleveland Hopkins Airport, CLEVELAND, O. United Airlines, American Airlines, Standard Oil Co., Republic Steel, M. A. Hanna Co. & Thompson Products, Inc., Midland Bldg., Cleveland, O. Awarded Feb. 9. CD 2/2, under LB; **American Constr. Co.**, 4100 Brookpark Rd., Cleveland 29, O. CA Est. **$750,000,** site work for 2 hangars, Cleveland Hopkins Airport (Cleveland, O.).

▲ **H. K. Ferguson Co.**, 1783 E. 11 St., Cleveland 11, O. CA **$2,500,000.** Total est. $85,000,000. excavation of 600,000 cu. yd. earth for stamping plant, TWINSBURG, O. Chrysler Corp., 3675 E. Outer Dr., Detroit, Mich. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., archt. Awarded Feb. 9. CD 11/21, under Industrial Buildings.

▲ **ILLINOIS**—State Div. Hys., Centennial Bldg., Springfield,

Ill.—**Powers-Thompson Constr. Co.**, 27 S. Chicago St., Joliet, Ill., CA, **$1,424,337**, c. conc. 6.93 mi. U. S. Rte. 66, Will Co.; CA **$637,636**, conc. base course 1.76 mi. base course wid'n. 15.52 mi., 2 rein.-con. bridges, wid'n. existing rein.-con. box culvert on Ill. Rte. 47 and U.S. 6, Grundy and Kendall Counties;

Ill.—**E. T. Simonds Constr. Co., Inc.**, P.O. Box 356, Carbondale, and **J. D. Barter Constr. Co.**, Harrisburg, Ill., CA, **$666,963**, conc. base course 4.56 mi. and c. conc. wid'n. 6.27 mi. U.S. Rt. 24, Adams Co.;

Ill.—**Eric Bolander Constr. Co.**, Winchester Rd., Libertyville, Ill., CA, **$1,639,666**, c. conc. 5.34 mi. U.S. Rte. 66, Will Co.;

Ill.—**E. A. Meyer Constr. Co.**, 1539 Morrow Ave., North Chicago, Ill., CA, **$1,191,491**. c. conc. 7.3 mi. U.S. Rte. 66, Will Co.;

Ill.—**Bushman Constr. Co.**, 3706 Broadway, Kansas City, Mo., CA **$878,038** c. conc. 26.1 mi. Ill. Rte. 111, Madison Co.;

Ill.—**Orr Constr. Co.**, 27 E. 19 Pl., Chicago Heights, Ill., CA, **$1,970,481** c. conc. 6.63 mi. U.S. Rte. 66, Will Co., CD 2/2, under LB;

Ill.—**Johnston Roadbuilders, Inc.**, 1 S. Eastern Ave., Joliet, Ill., CA, **$87,782**, b. conc. resurf., waterbound macad base course 0.5 mi. 31 St. and Lombard Ave., Cook Co. CD 1/10. Grand total $8,496,394.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich. LB **$1,773,903**, est. $1,700,000. (4 bidders) vehicular bridge Fort St., pedestrian bridge and railroad bridge Fort St. Union Depot over John C. Lodge Expressway incl. retaining walls, approach paving, light, power and signal facilities, BUI 81 of 82-22-12 CL (BUI 404 52), BUI X1 of 82-22-12 C6 (BUI 404 52), Wayne Co.;

Mich.—**C. A. Hull and C. A. Hull Co., Inc.**, Birmingham, Mich. LB **$150,821**, est. $170,000. (13 bidders) rein.-con., steel bridge South Hill Rd. over relocation of US-16 a mile east of Hudson, IN 83 of 63-11 C1-RO (IN 04-4 (6), Oakland Co. Bids Feb. 8. CD 1/26.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Sugden & Sivier, Inc.**, 13100 Cloverdale St., Oak Park, Mich., and **Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe, Mich. CA **$2,664,507**, est. $3,000,000. dual c. conc. 7.695 mi. on relocation US-16, IN 63-29 C9-0 (IN 04-4 2), Oakland Co., CD 2/8, under LB;

Mich.—**Sargent Constr. Co.**, 2840 Bay Rd., Saginaw, Mich. CA **$2,235,834**, est. $2,500,000. dual c. conc. wid'n. 10.625 mi. M-78 and US-27, M 25-17 C14 RN, M 25-17 C15-UN, etc., Eaton Co. CD 2/2, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Carl Goodwin & Sons**, Allegan, Mich. LB **$2,116,701**, est. $2,200,000. (11 bidders) c. conc. paving south roadway relocation US-12 from Miller Rd. east to existing US-12 dual concrete paving, relocation US-12 from US-131 east to Miller Rd., IN 39-40 C7-RN, (IN 02-3 1) Part 2, IN 39-40 C8-UN (IN 92-3 1), Part; M 39-51 C6-R, Kalamazoo Co.;

Mich.—**Comstock Constr. Co.**, Bay City, Mich. and **H. C. Shingledecker**, Pontiac, Mich. LB **$153,939**, est. $180,000. (11 bidders) stabilized aggregate surf. 2.382 mi. SS 73-64 C6-R, SS 73-61 C7-U (S 2113), Saginaw Co.;

Mich.—**Nagelkirk & Ranta**, 2550 Chicago Dr. S. W., Grand Rapids, Mich. LB **$470,628**, est. $530,000. (19 bidders) stabilized aggregate surf. 7.77 mi. M-43, SS 8-47 C7-R (S 760 3), Barry Co. Bids Feb. 8. CD 1/26.

BUILDINGS—LB & CA

▲ **Albert M. Higley Co.**, 2036 E. 22 St., Cleveland, O. CA Est. **$6,000,000.** 2 story STORE, incl. super service station, air-conditioned, etc. in South Gate Shopping Center, Maple Heights, CLEVELAND, O. Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill. CD 12/1.

▲ **American Bridge Div., U. S. Steel Corp.**, Ambridge, Pa., CA Est. **$2,000,000.** approx. 53,000 sq. ft. MILL for production of welded wire fabric, Cuyahoga Works, CLEVELAND, O. American Steel & Wire Div. of U. S. Steel Corp., Rockefeller Bldg., Cleveland 13, O. CD 2/14.

▲ **Cranbrook Builders, Inc.**, 2224 Fairhill Rd., Cleveland 6, O. Own Forces. **$4,000,000.** 274 HOMES, 70-acre site, Lee Rd.-Seville Ave. area, CLEVELAND, O.

▲ **Raymond Johnson**, Route 5, Valparaiso, Ind., Own Forces, **$4,000,000.** 200 HOMES, paving and sewers, VALPARAISO, IND. Peller & Tanck, 16 N. Franklin St., archts.

▲ **Leonard Constr. Co.**, 37 S. Wabash St., Chicago, Ill., CA Est. **$5,000,000,** MFG. PLANT and ADMINISTRATION BLDG., BENSENVILLE, ILL. James B. Clow & Sons, Inc., 201-299 N. Talman Ave., Chicago, Ill. DeLeuw, Cather & Co., 150 W. Wabash St., Chicago, Ill., engrs.

▲ **Downey Constr. Co.**, 7593 Hofman Ave., Munster, Ind. Own Forces. **$3,500,000.** 300 HOMES, CALUMET CITY, ILL. L. H. Warriner, 527 Broadway, Gary, Ind., archt.

▲ **Sumner Sollitt Constr. Co.**, 307 N. Michigan Ave., Chicago, Ill., CA, **$10,617,000.** Phase II, Frances Cabrini Extension, incl. two 7 story APARTMENTS, three 10 story APARTMENTS, two 19 story APARTMENTS, 1 story COMMUNITY BLDG., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago 5, Ill. CD 1/20, under LB.

▲ **W. Harold Tanner**, 20 E. St. Charles St., Villa Park, Ill. Own Forces. **$1,800,000.** 150 HOMES, LOMBARD, ILL.

▲ **Edra Home Builders**, 519 E. Maple St., Mundelein, Ill., Own Forces, **$6,750,000.** 500 HOMES, near MUNDELEIN, ILL.

▲ **Naperville Highland Homes, Inc.**, 540 Prairie St., Naperville, Ill., Own Forces, **$5,000,000.** 300 HOMES, NAPERVILLE, ILL. Harry Juinn, 8046 S. Western St., Chicago, Ill., archt.

▲ **Kopman & Hassin**, 13855 Nine Mile Rd., Oak Park, Mich. CA Est. **$2,400,000.** 60 brick ranch HOUSES, Cranbrook Cross Rd., BLOOMFIELD, MICH. Bruton Realty Co., 15100 Fenkell St., Detroit, Mich.

▲ **Duncan Constr. Co.**, Pontiac, Mich. CA Est. **$2,000,000.** 165 brick ranch HOUSES Loehaven and Elizabeth Lake Rd., WATERFORD, MICH. Rose-Hill Realty Co., 17300 Grand River St., Detroit, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

March 1 Kansas March 2 North Dakota

STREETS AND ROADS

February 28 Colorado March 1 Kansas

March 2 North Dakota

BUILDINGS—BA

▲ **Tex., Houston**—SHOPPING CENTER—BA About 3/1—Dan Moody Interests, Abstract & Title Bldg., shopping center. $3,000,000. Irving Klein & Assocs., 1317 Austin St., archts. CD 2/14.

▲ **Tex., Freeport**—ADMINISTRATION CENTER, etc.—BA 3/1 Dow Chemical Co. (Plant B), Freeport, administration center, $3,150,000; cafeteria, $350,000. MacKie & Kamrath, 2713 Ferndale St., Houston, archts. Walter P. Moore, 2 Pinedale St., and Bernard Johnson & Assocs., 4926 Travis St., Houston, engrs. CD 1/16.

▲† **S. D., Fort Meade**—HOSPITAL—BA 4/17—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C. 2 story hospital, 4 utility bldgs., etc. $3,000,000. Ellerbe & Co., E. 505 First Natl. Bank Bldg., St. Paul, Minn., archts. CD 10/6.

HEAVY CONSTRUCTION—LB & CA

▲† **T. C. Bateson Constr. Co.**, 6800 Denton Dr., Dallas, Tex. LB $3,081,622. field maintenance hangar, Smoky Hill Air Force Base, ENG-23-028-56-56, SALINA, KAN. U. S. Eng., Federal Office Bldg., Kansas City, Mo. Bids Jan. 27. CD 1/11.

BUILDINGS—LB & CA

▲ **M. W. Watson**, National Bank of Topeka Bldg., Topeka, Kan. CA general constr. 2 story, 110x265 ft., concrete, steel, masonry home OFFICE, COLUMBIA, MO. Total est. cost $1,750,000. M.F.A. Mutual Insurance Co., J. M. Silvery, pres., 201 S. 7 St., Columbia, Mo. Childs & Smith, 20 N. Wacker Dr., Chicago, Ill., archts.;
Natkin & Co., 5555 Manchester Ave., St. Louis 10, Mo. CA plumbing, heating and refrigeration work (Columbia, Mo.).

▲ **John B. Gutmann Constr. Co.**, 1301 S. Vandeventer Ave., St. Louis 10, Mo. CA Est. $3,500,000. 6 story, ground floor, bsmnt., penthouse, 64x170 ft. and 20x64 ft. wing addn. to St. Mary's HOSPITAL, Clayton Rd. and Bellevue Ave., RICHMOND HEIGHTS (ST. LOUIS 17 P. O.), MO. Sisters of St. Mary's Inc., Rev. Mother M. Concordia SSN, Mother General, 6420 Clayton Rd., Richmond Heights 17, Mo. Lewis Siberz, 1920 Monroe St., Madison, Wis., struct. engr. and archt. John D. Falvey, 316 N. 8 St., St. Louis 1, Mr., mech. engr.

▲ **Manhattan Constr. Co.**, Manhattan Bldg., Muskogee, Okla. CA Est. $2,000,000. addnl. electrical BLAST FURNACE at Sheffield Plant, SAND SPRINGS, OKLA. Armco Steel Co., Sand Springs, Okla. F. A. Westphal, Sand Springs, engr. Awarded Feb. 8. CD 10/19.

▲ **C. H. Leavell & Co.**, 1900 Wyoming St., El Paso, Tex. and **Dan R. Ponder, Inc.**, 327 Morgan Ave., El Paso, Tex. CA $12,493,974. construct and finance 944 HOUSING units, Abilene Air Force Base, ABILENE, TEX. Base Procurement Office, Carswell Air Force Base, Fort Worth, Tex. CD 1/30, under LB.

▲ **Yarbrough Constr. Co.**, Box 851, Austin, Tex. CA $2,553,962. (1) South unit Women's DORMITORY, (2) North Unit Women's DORMITORY, (3) Center Unit Women's DORMITORY, AUSTIN, TEX. University of Texas, Bd. Regents, Admin. Bldg., Austin, Tex. Bids Jan. 24. CD 1/30, under LB.

▲ **W. S. Bellows Constr. Corp.**, Box 2132, Houston, Tex. CA Approx. $2,250,000. SHOPPING CENTER, BEAUMONT, TEX. Beaumont Village Corp., c/o First Mortgage Co. of Houston, 510 Taft St., Houston, Tex. CD 8/15.

▲ **E. B. Badger & Sons Co.**, c/o Stone & Webster Eng. Co., 90 Broad St., New York, N. Y. CA Est. $3,000,000. 20 million pounds per year Styrene PLANT, BIG SPRINGS, TEX. Cosden Petroleum Corp., Permian Bldg., Big Spring, Tex. CD 5/6/53, under LB.

▲ **Robert E. McKee General Contractor, Inc.**, Box 2448 Inwood Station, Dallas, Tex., CA $2,700,000. general constr. 16 story home OFFICE, DALLAS, TEX. Dallas Federal Savings & Loan Assn., c/o E. E. Shelton, Magnolia Bldg., Dallas, Tex. Bids Jan. 11. CD 1/11.

▲ **Farnsworth & Chambers Co., Inc.**, Box 74, Houston, Tex. LB $2,235,000, Frank M. Black Junior HIGH SCHOOL, HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol St., Houston, Tex. Bids Feb. 2. CD 12/23.

▲ **Foster Wheeler Corp.**, 165 Broadway, New York, N. Y. CA, Est. $2,500,000. complete new 4-unit lubricating oil PLANT, CASPER, WYO. Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago 5, Ill. Awarded Feb. 12.

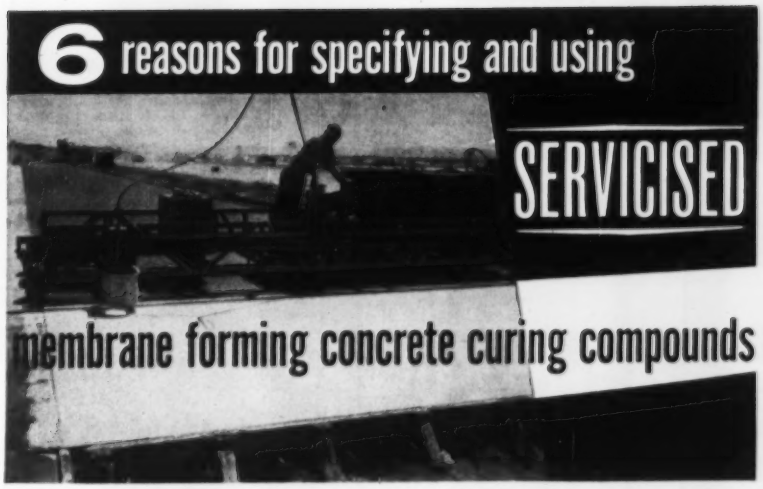
FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
March 8 California
STREETS AND ROADS
March 7, 8 California

▲ **Washington**—BA 3/12—Grant County Public Utility Dist., Ephrata, rein.-con., earthfill dam about 8,000 ft. long across Columbia River at Priest Rapids near Richland to develop 79 ft., head and 600,000 kw. Total est. $120,000,000. Harza Eng. Co., 400 W. Madison St., Chicago, Ill., engr. CD 11/21.

▲ **Oregon**—BA 3/16—Portland General Electric Co., 621 S.W. Alder St., Portland, concrete arch dam, power house, spillway, regulating dam, fish ladder, Pelton Dam Proj., Deschutes River, Pelton Hydro-



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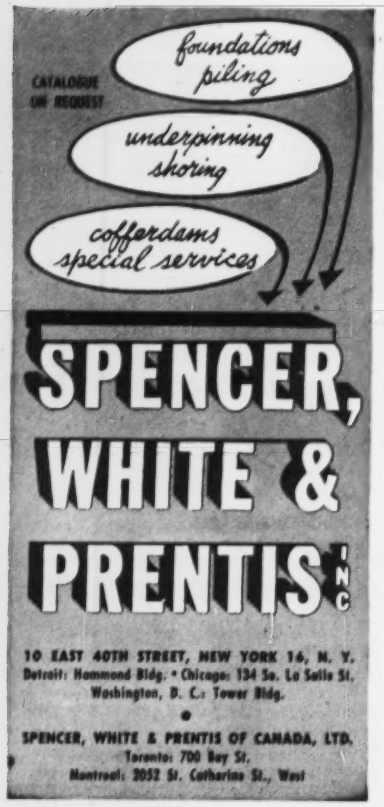
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electric Proj., Jefferson Co. Total est. $25,000,000. CD 2/13.

BUILDINGS—BA

▲† **Calif., Nimbus**—PLANT—BA 3/6—Air Products, Inc., 322 Beach St., Inglewood, liquid oxygen plant. $4,000,000. Owner will construct and operate for the air force. CD 2/10.

▲ **Wash., Spokane**—DEPARTMENT STORE—Bids Asked—Bon Marche, Main and Howard Sts., 5 story, bsmt., rein.-con. Bon Marche Department Store addn. for Allied Department Stores, 401 5 Ave., New York, N. Y. $2,500,000. J. Graham & Co., 1426 5 Ave., Seattle, Zone 1, archts. CD 6/22.

HEAVY CONSTRUCTION—LB & CA

▲ **R. H. Fulton & Co.**, Cut-off Road, Lubbock, Tex., CA, Est. $3,000,000 156-mi. natural gas lateral, Plymouth to Spokane and 129-mi. branch lines from Spokane, Wash. to Coeur d'Alene, Moscow and Leiston, Idaho, IDAHO and WASHINGTON. Pacific North-West Pipe Line Corp., M & M Bldg., Houston, Tex. Grand total est. $13,400,000. CD 4/11/52;
Curtis Constr. Co., Cape Girardeau, Mo., CA Est. $2,250,000. installing 87 mi. 26 in. natural gas pipe line, Duvall to Canadian border, King, Snohomish, Skagit and Whatcom Counties, Wash. (Idaho and Washington);
B & M Constr. Co., Republic Bldg., Oklahoma City, Okla., CA Est. $1,300,000. installing 53-mi. natural gas pipe line, Tacoma to Duvall, Wash. Pierce and King Counties, Wash. (Idaho and Washington);
River Constr. Corp., 6100 Camp Bowie Blvd., Fort Worth, Tex., CA Est. $1,600,000, installing 64-mi. 26 in. natural gas pipe line, Toledo to Tacoma, Lewis and Pierce Counties, Wash. (Idaho and Washington);
Midwestern Constructors, Inc., 105 N. Boulder St., Tulsa, Okla., CA Est. $1,750,000. installing 79-mi. 26 in. natural gas pipe lines Stevenson to Toledo, Skamania and Lewis Counties, Wash. (Idaho and Washington);
Engineers Ltd., Inc., 200 Bush St., San Francisco, Calif., CA Est. $1,500,000. installing 56 mi. 26 in. natural gas pipe line, Goldendale to Stevenson, Klickitat and Skamania Counties, Wash. (Idaho and Washington);
A.P.V. Co., Inc., Fort Worth, Tex., CA Est. $2,000,000, installing 81 mi. 26 in. natural gas pipe line, Plymouth to Goldendale, Benton and Klickitat Counties, Wash. (Idaho and Washington).

▲ **Hallmac Constr. Co.**, 2261 W. Holcombe St., Houston, Tex., CA, $6,500,000, natural gas distr. sys. in and near SPOKANE, WASH. Spokane Gas & Fuel Co., N. 25 Monroe St., Spokane, Wash. Bids Dec. 15. CD 11/22.

BUILDINGS—LB & CA

▲ **The Austin Co.**, 16112 Euclid Ave., Cleveland, O., CA Total est. $8,500,000. design and construct, 558,000 sq. ft. PLANT and OFFICE BLDG., RENTON, WASH. Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Wash.

▲ **The Austin Co.**, 16112 Euclid Ave., Cleveland 12, O., CA $21,000,000, design and construct four rein.-con., steel 1,021,000 sq. ft. DEVELOPMENT CENTER BLDGS., SEATTLE, WASH. Boeing Airplane Co., 7755 E. Marginal Way, Seattle, Wash.

▲ **J. b. Gill Co.**, 2901 Orange St., Long Beach, Calif., CA, Est. $2,000,000, design and construct first stage PROCESSING UNITS of oil refinery, TACOMA, WASH. U. S. Oil & Refining Co., Tideflats, Tacoma, Wash. CD 7/15.

▲ **Nylin P. Hurd**, 1317 Santiago Ave., Santa Ana, Calif., CA $2,000,000. 132,800 sq. ft. HIGH SCHOOL, COVINA, CALIF. Covina High School Dist., Covina, Calif. Bids Jan. 17. CD 1/24, under LB.

CANADA

BUILDINGS—BA

▲ **Que., Montreal**—GARAGE—BA 2/28—Montreal Transportation Comn., 159 Craig St. W., bus garage exten. $2,000,000. J. Archambault, c/o owner, ch. engr.

BUILDINGS—LB & CA

▲ **International Bechtel Ltd.**, 44 King St. W., Toronto, Ont., CA $6,500,000. Design and construct PLANT, EDMONTON, ALTA. Alberta Phoenix Tube & Pipe Ltd., Edmonton, Alta. CD 11/14.

▲ **Procon (Canada) Ltd.**, 40 Advance Rd., Toronto, Ont., CA $5,500,000, addnl. REFINING FACILITIES, incl. new fluid catalytic cracking plant, PORT CREDIT, ONT. Regent Refining (Canada) Ltd., 184 Bay St., Toronto, Ont. Awarded Feb. 1.

▲ **Alain Constr., Inc.**, 9777 Decarie Blvd., Montreal, Que., Separate Contracts, $5,500,000. 240-unit HOUSING DEVELOPMENTS, BEACONSFIELD, QUE. David G. Woods, 1461 Mountain St., Montreal, Que., archt.

▲ **Home Owners Corp., (J. & A. Pagana Ltd.**, 8251 St. Lawrence Blvd., **Z. Marcelin**, 2227 Fleming St.; **G. Tait**, 866 Canora Rd., **J. A. Brodeur**, 27 Maplewood Ave., **R. Gervais**, 1975 Laird Blvd., **Candia Homes Co.**, 7455 Mulberry Ave., and **Louis Racz Co. Ltd.**, 140 Wicksteed Ave., all in Montreal, Que.), 1940 Graham Blvd., Mount Royal, Montreal, Que. Owner Builds, $6,000,000, 200-unit HOUSING DEVELOPMENT, MONTREAL, QUE. Thibodeau & Thibodeau, 940 Cote de Liesse Rd., Montreal, Que., archts. CD 12/1.

ALASKA

HEAVY CONSTRUCTION—LB & CA

▲† **M-B Contg. Co., Lloyd Bldg.**, Seattle 1, Wash. LB $9,045,575. (3 bidders) runway and taxiway extens., hardstands and truck-fill stand, Elmendorf Air Force Base, Inv. 56-31, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Feb. 14. CD 2/6.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Guatemala**—BA 2/21—Departmento de Bienes Nacionales Licitaciones y Asuntos Alemanes, 14 Calle, No. 3-60, Guatemala City, superstructure and substructure for Atlantic Hy. Bridge over Rio Las Vacas. Tippetts-Abbett-McCarthy-Stratton, 52 W. 47 St., New York, N. Y., U. S. A., and Gibbs & Hill, Inc., Penna. Station, New York, N. Y., U. S. A., engrs. CD 2/8.

HEAVY CONSTRUCTION—LB & CA

▲ **Sam Macri & Sons, Inc.**, 1914 Minor St., Seattle, Wash., U.S.A. CA $2,827,604, Proj. L-1 Littoral Hy. constr., EL SALVADOR. Proveeduria Especificia de Obras Publicas, San Salvador, El Salvador, Bids Nov. 15, CD 11/7;
Constructora el Aguilla de Mexico, Mexico City, CA $3,747,867, Proj. L-2; CA $4,106,660, Proj. L-3 (El Salvador);
Johnson, Drake & Piper, Inc., 86 Trinity Pl., New York, N. Y., U.S.A., and **Farnsworth & Chambers Co., Inc.**, 3018 Leeland St., Houston, Tex., U.S.A., CA $1,648,203, Proj. L-4 (El Salvador);
Layco SA; J. Fonseca y Compania, San Salvador; **Canas y Compania**, San Salvador CA $6,222,134, Proj. L-5 (El Salvador).

BUILDINGS—LB & CA

▲ **Blaw-Knox Co.**, Farmers Bank Bldg., Pittsburgh, Pa. and **International General Electric Co.**, 570 Lexington Ave., New York, N. Y. CA Est. $8,500,000. hot strip mill steel PLANT expansion, HUACHIPATO, CHILE. Cia de Acero del Pacifico S. A., Concepcion, Chile.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Scotland, Glasgow**—TUNNEL—Bids Asked—City of Glasgow, Whiteinch-Linthouse tunnel under River Clyde. $14,000,000. CD 7/28/49.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Fla., Panama City**—Bay Co. Court House, bond election in May, WW imprvs. $5,000,000. J. B. Converse & Co., 106 St. Joseph St., Mobile, Ala., consult. engrs. CD 2/5/54.

▲ **Tex., Fort Worth**—City, City Hall, voted bonds Jan. 31, WW, $17,000,000; WW $14,250,000. CD 12/30.

SEWERS, WASTE DISPOSAL

▲ **Pa., Harrisburg**—City, City Hall, sewage treatment plant, Elliott St. west of Cameron St.; two pumping stations. $4,800,000. Gannett, Fleming, Corddry & Carpenter, 600 N. Second St., consult. engrs. CD 11/25/46.

▲ **Ont., Hamilton**—City, City Hall, sewage plant expansion, $13,000,000. Proctor, Redfern & Laughlin, 11 Jordan St., Toronto, consult. engrs.

STREETS AND ROADS

▲ **Calif., Pasadena**—City, City Hall, $6,692,000. bond election Mar. 8, street imprvs. CD 11/15/44.

▲ **OHIO**—State Hy. Dpt., Columbus,
Lorain Co.—(1) imprvt. U. S. Rte 6 approaches to Black River Bridge, $112,500;
relocation State Rte. 57, incl. interchange with Rte. 611 and separated grade crossing with B. & O. R.R. and E. 21st St., incl. underpass at Broadway and Nickel Plate R.R., $4,631,800.
imprv. Rte. 611, interchange with Rte. 57 and widen other parts to 4-lanes, $631,000.
wid'n. Rte. 58 to 40 ft. between U.S. 6 and State Rte. 611, $166,000.
State Rte. 254, exten. of 4-lane widening west to Oberlin Ave. and to the east, $910,000.
reconstr. and extend Reid Ave., $132,700.
constr. new road along E. 36 St., diagonally to 38th St. and then 4-lane hy. between Broadway and Fulton Rd. incl. underpass at B. & O. R.R. crossing, $1,617,000.
wid'n. Washington Ave. from E. Erie Ave. to W. 38 St. $129,000, Browne, Roberts & Assoc., Marion, consult. engrs.
Wayne Co.—expressway sys. incl. by-passes around business district for 4 highways, U. S. 30 and 250, State Rtes. 3 and 5 with 6 interchanges, $8,889,000, Shaffer, Parrett & Assocs., 2585 Cleveland Rd., Wooster, consult. engrs.

AMERICANS ABROAD

▲ **Iraq**—Development Bd., Baghdad, plans Esski-Mosul proj., incl. water and power dam on Tigris River north of Mosul City. $44,000,000. Harza Engineering Co., 400 W. Madison St., Chicago, Ill., U. S. A., consult. engr. will make final survey and detailed studies. CD 8/15.

▲ **Japan, Tokyo**—HOTEL—Tokyo Electric Express Railway, Ltd., Tokyo, Japan, and Hilton Hotels International, Inc., 301 Park Ave., New York 22, N. Y., U. S. A., Tokyo Hilton Hotel. $5,000,000-$6,000,000.

FOREIGN

▲ **Italy, Rome**—Ministry of Transport, Rome, Italy, plans, 11 kms. subway to connect Central Railway Depot with eastern outskirts. $80,000,000.

PUBLIC BUILDINGS

▲ **Calif., Anaheim**—SCHOOLS—Anaheim City School Dist., Anaheim, voted $3,500,000 bonds, schools. CD 11/21.

▲ **Calif., Antioch**—SCHOOLS—Antioch-Live Oak School Dist., c/o Supt., ABC Bldg., Anitoch, voted $5,000,000 bonds, schools and and existing school addns. $5,000,000. CD 11/22.

▲ **Calif., Huntington Beach** — SCHOOLS — Huntington Beach Union High School Dist., Huntington Beach, $2,750,000 bond election Mar. 20, schools. CD 1/5.

▲ **Calif., Redlands**—SCHOOLS—Redlands School Dist., voted $2,050,000 bonds Jan. 27, schools. CD 1/20.

▲ **Calif., San Francisco**—HOUSING—San Francisco Housing Auth., 440 Turk St., plans by Spencer & Ambrose, 251 Kearny St., 146-unit housing project. $2,742,106. CD 12/13/51.

▲† **Conn., Hartford**—FEDERAL OFFICE—General Services Admin., General Services Bldg., Wash. 25, D. C., federal office bldg., incl. post office $8,000,000. May be included in 1957 budget.

▲ **Kan., Merriam**—SCHOOL—Bd. Educ., Shawnee-Mission Dist. High Schools, 7401 Mission Dr., $4,000,000 bond election Mar. 7, Senior High School, near Kansas City, Neville, Sharp & Simon, 12 and Walnut Street Bldg., Kansas City, Mo., archts. CD 11/3.

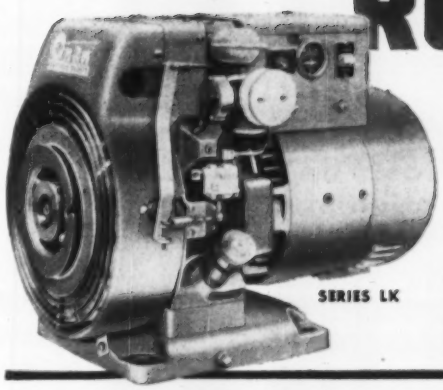
▲ **Ky., Louisville**—HOSPITAL—City, 323 E. Chestnut St., plans by Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, O., and Joseph & Joseph, Assoc. archts., Speed Bldg., Louisville, 4 story General Hospital addn., alterations to present bldg., $4,000,000. E. R. Ronald & Assoc., 554 S. Third St., Louisville, consult. engrs. Bids about February or March. CD 12/7/54.

▲ **Md., Cheverly**—HOSPITAL—Prince George's County Hospital, Cheverly, plans by Faulkner, Kingsbury & Stenhouse, Ring Bldg., Wash., D. C., hospital, $2,000,000-$3,000,000. Constr. in 1957.

▲ **Mass., Amherst**—SCIENCE CENTER—State, University of Mass., c/o Div. Bldg. Constr., 38 Chauncey St., Boston, plans by James H. Ritchie & Assoc., 135 Clerendon St., Boston, U-901, science center (second section), University of Mass. $2,000,000. CD 2/10/50.

▲ **Mass., Taunton** — HOSPITAL — State, Dpt. Mental Health, c/o Div. Bldg. Constr. Div., 38 Chauncey St., Boston, plans by Kendall Taylor & Co., Inc., 12 Norfolk St., Cambridge, M-901 R, overall study, State Hospital, $3,000,000.

▲ **Mich., Marquette**—POWER PLANT—City, George E. Meholock Jr., mgr., Marquette, municipal power plant expansion, plant addn., purchasing diesel generating units. $2,000,000.



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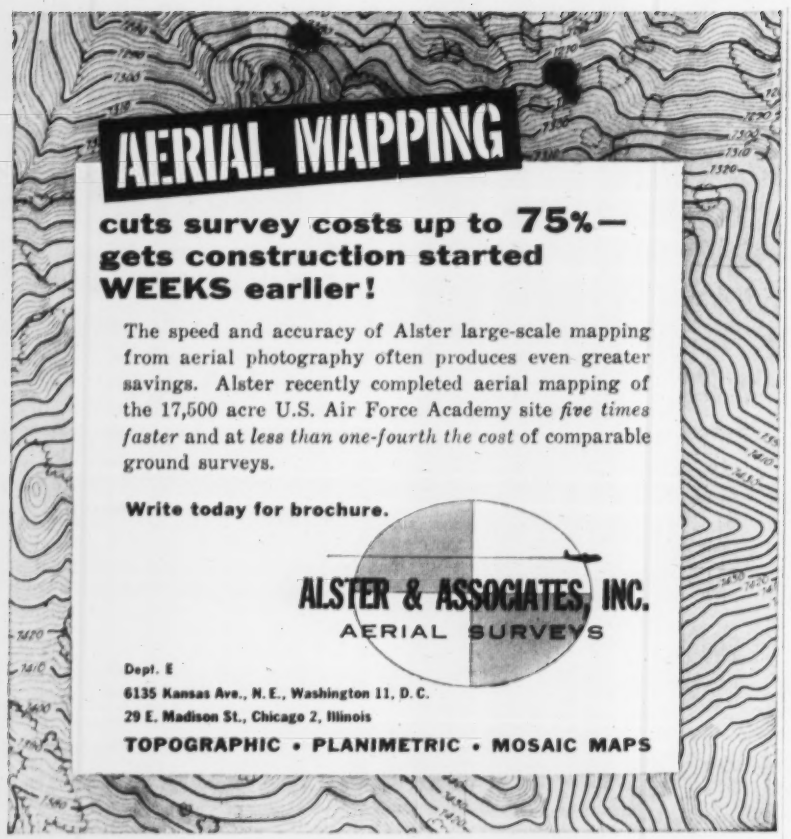
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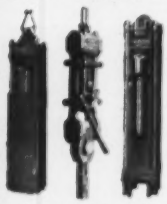

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▲ Mich., Royal Oak—SCHOOL—Bd. Educ., Lamphire School Dist. No. 4, Leonard Maker, secy., John R and 13 Mile Rd., school program, incl. Junior High School, two elementary schools. $3,000,000. Bond election probably in March.

▲ Minn., Richfield (P. O. Minneapolis)—SCHOOL—Bd. Educ., Independent School Dist. No. 12, H. E. Rumpel, supt., $2,175,000 bond election Feb. 28, Junior High School, grade school, complete high school athletic field, etc.

▲ Neb., Omaha—GENERATING UNIT—Omaha Public Power Dist., 17 and Harney Sts., third generating unit, $16,500,000. Pioneer Service & Eng. Co., 231 S. LaSalle St., Chicago, Ill. engrs. A. G. Johnson, c/o owner, ch. engr. CD 8/27/54.

▲ N. Y., Freeport—SCHOOL—School Dist. No. 9, referendum vote on Mar. 22, Senior High School on 15 acre site west of Brookside Ave. between Merrick Rd. and Sunrise Hy. $3,500,000. CD 7/6.

▲† N. Y., Lewiston—PLANT—Navy Dpt., 18 and Constitution Ave. N.W., Wash. 25, D. C., plant operated by Olin Mathieson Chemical Corp., Niagara Falls. $3,000,000. Siegmaster & Breyer, 420 Lexington Ave., New York, consult. engrs.

▲ N. Y., Uniondale—HOME—Nassau Co. Dpt. P. Wks., Old County Court House, Mineola, county home for the aged, $2,000,000.

▲† Vt., Burlington—POST OFFICE, etc.—General Services Admin., 18th and F Sts. N. W., Wash. 25, D. C., plans by Freeman, French & Freeman, archts.-consult. engrs., 138 Church St., post office and court house. $2,830,000. CD 7/29.

▲ Wyo., Casper—SCHOOLS—Natrona County High School Dist. and School Dist. No. 2, Casper, voted $1,000,000 bonds, Junior High School in East Casper and 5 schools addns. and remodeling. $2,000,000. Holzinger-Schropfer & Associated, 382 E. 2 St., consult. engrs.-archts. CD 12/21.

▲ Ont., Toronto—HOSPITAL—Toronto East General Hospital, Coxwell St., plans by August Martineau & Assocs., Evans Ave., Islington, laundry and internes bldg. $3,113,000. Arthur H. Frampton & Co., 38 King St. W., consult. engrs. Bids in April. CD 9/28.

COMMERCIAL BUILDINGS

▲ Ark., Blytheville—HOUSING—Procurement Officer, Blytheville Air Force Base, Blytheville, plans by Swaim & Allen & Assocs., archts.-engrs. Gazette Bldg., Little Rock, construct and finance, 360 housing units, Blytheville Air Force Base. CD 1/31.

▲ Calif., Buena Park—DWELLINGS—Aetna Constr. Inc., 1308 Shatto Pl., Los Angeles, plans by David Freeman, 201 N. Robertson Blvd., Beverly Hills, 226 frame, stucco dwellings, $2,500,000.

▲ Calif., Fullerton—DWELLINGS—Armexco Corp., 4302 E. Stearns Ave., Long Beach, plans by Western Drafting, 494 Newport Blvd., Newport Beach, 400 frame, stucco dwellings, Cypress Ave. and Nutwood St. $4,000,000.

▲ Calif., Los Angeles—OFFICE—International Business Machines Corp., 1670 Wilshire Blvd., Los Angeles, Zone 17, plans by Pereira & Luckman, 9220 Sunset Blvd., 13 story, 217,000 sq. ft. office, Wilshire Blvd. and Mariposa Ave., $2,000,000. To go-ahead 1956.

▲ Calif., San Rafael—SHOPPING CENTER—Melvin Swig, Fairmont Hotel, California and Mason Sts., San Francisco, shopping center, 2 mi. north of here. $7,000,000.

▲ Fla., Melbourne—RESIDENCES—Harry Wolfe, Melbourne, 3,500 residences in residential project and shopping, Park Area, Lake Washington, northeast of here. $35,000,000.

▲ Ky., Newport—HOMES—Thomas Shields, 307 York St., 119 homes, vicinity of Joyce Ave., $2,142,000.

▲ Mich., Troy—SHOPPING CENTER—Mitchel Smith, 4629 W. Fort St., Detroit 9, Mich., shopping center, 280,000 sq. ft. of stores, Livernois South of 15 Mile Rd. $5,000,000.

▲ N. Y., Brooklyn—HOSPITAL—Norwegian Hospital, 4520 Fourth Ave., Zone 20, plans by Rogers & Butler, 219 E. 44 St., New York, Zone 17, hospital on Fourth Ave., $2,000,000. CD 1/31/50.

▲ N. Y., New York—OFFICE—Joseph P. Blitz, Inc., 150 E 39 St., Zone 16, 25 story office, W. 52 St. northeast corner of Avenue of Americas, $4,000,000.

▲ N. Y., New York—APARTMENT—Syndicate, c/o Leo Stillman, archt., 332 E. 149 St., Zone 51, 18 story apartment, Third Ave. from 51 to 52 Sts. $5,000,000.

▲ N. Y., New York—APARTMENT—Wolosoff Bros. & Minkin, 138-50 78 Ave., Flushing, 20 story apartment, Second Ave., 68 to 69 Sts. $8,000,000.

▲ N. Y., Plattsburgh—HOUSING—Procurement Office, Plattsburgh Air Force Base, Plattsburgh, plans by Kelly & Gruzen, engrs.-archts. 80 Fifth Ave., New York, Zone 11, construct and finance, 1,685 housing units, CD 1/31/56.

▲ N. Y., Rome—HOUSING—Procurement Office, Griffiss Air Force Base, Rome, plans by Lorimer Rich & Assoc., engrs.-archts., 35 W. 53 St., New York, construct and finance, 460 housing units. CD 1/31/56.

▲ N. D., Minot—HOUSING—U. S. Eng., 1709 Jackson St., Omaha, Neb., plans by Brunner, Hoeffel, Bohrer, Minot, construct and finance, housing development, Minot Air Force Base. $6,075,000. Ira Rush, Minot, assoc. archt. CD 10/26, under Airports.

▲ Tex., Big Spring—HOUSING—Procurement Officer, Webb Air Force Base, Big Spring, plans by John W. Floore, 1401 W. Lancaster St., Fort Worth, construct and finance, 460 unit housing proj., Webb Air Force Base. $6,000,000. CD 1/31.

▲ Utah, Salt Lake City—HOSPITAL WING—Sisters of The Holy Cross, 1113 E. Jefferson Blvd., South Bend, Ind. wing for Holy Cross Hospital. $2,000,000.

▲ Va., Richmond—HEADQUARTERS—Seaboard Air Line R. R. Co., W. D. Simpson, ch. engr., Seaboard Bldg., Norfolk, Zone 10, plans by Baskervill & Son, 2313 W. Cary St., 5 story headquarters bldg., Broad and Rosengarth Sts. $2,500,000. Hankins & Anderson, 16 N. 5 St., consult. engrs.

INDUSTRIAL BUILDINGS

▲ Ariz., Kyrene—PLANT—Thunderbird Chemicals Corp., Kyrene, ammonia chemicals plant. $11,000,000.

▲ Ariz., Phoenix—PLANT—Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill., 150,000 sq. ft. plant for military electronics engineering, research and production. $3,000,000.

▲† Calif., Nimbus—PLANT—Air Materiel Command, Springfield Pike, Dayton, O., liquid oxygen and nitrogen plant. $4,000,000. Project will be constructed and operated by Air Products, Inc., 733 W. Broad St., Allentown, Pa.

▲ Iowa, Eddyville—POWER PLANT—Iowa Southern Utilities Co., Utilities Bldg., Centerville, power plant expansion, incl. building constr. and generating equip. $2,205,000.

▲ La., Baton Rouge—MONOMER UNIT—Foster Grant Co., Inc., Scenic Hy., expanding Monomer Unit to 50,000,000 lb. annually, $4,000,000.

▲ La., Luling—PLANT—Monsanto Chemical Co., 1700 S. 2 St., St. Louis, Mo., adipic acid plant. $2,000,000.

▲ Mass., Brighton—INDUSTRIAL—New England Land Co., Elliott Henderson, 250 Boylston St., Boston, 25-30 industrial bldgs. $4,000,000.

▲ Mo., Pagedale (St. Louis 14 P.O.)—SERVICE—Stix, Baer & Fuller Co., Leo C. Fuller, chn. Bd., 601 Washington Ave., St. Louis, Zone 1, plans by Abbott, Merkt & Co., 10 E. 40 St., New York, N. Y., steel, concrete, masonry, two level service bldg., containing approx. 420,000 sq. ft. floor space for warehousing, delivery facilities, administrative offices and personnel facilities on 13 acre tract at Kingsland Ave. and Terminal R.R. tracks. $2,000,000. CD 1/31, under Mo., St. Louis.

▲ N. M., Hobbs—GENERATING UNIT—Southwestern Public Service Co., 418 Polk St., Amarillo, Tex., 96,000 hp. generating unit. $4,500,000.

▲ O., Cleveland—City, Dpt. P. Utilities, Emil J. Crown, dir., City Hall, Zone 14, sludge vacuum filters and incinerators for southerly sewage disposal plant. $2,000,000. Bids in late summer. Havens & Emerson, 640 Leader Bldg., Zone 14, consult. engrs. CD 11/7/52.

▲ Okla., Ada—PLANT—Ideal Cement Co., Denver Natl. Bank Bldg., Denver, Colo., plant. $12,000,000. M. O. Mathews, c/o owner, engr.

▲ Tex., Beaumont—REFINERY, etc.—Magnolia Petroleum Co., South Beaumont, 30,000 bbl. sovafining refinery unit, $7,500,000; 8,000 bbl. HF alkylation unit, $4,500,000. CD 12/27/51.

▲ Tex., Beaumont—REFINERY—Pure Oil Co., City Natl. Bank Bldg., Beaumont, aviation fuels refinery. $25,000,000.

▲ Tex., El Paso—REFINERY—Standard Oil Co. of Texas, Womble Blvd., 25,000 bbl. per day refinery. $20,000,000. CD 5/23/51.

▲ Tex., Houston—CHEMICAL PLANT—Tennessee Gas Transmission Co. and Food Machinery & Chemical Co., Commerce Bldg., expand chemical production capacity (next 5 years). $5,000,000.

▲ Utah, Ogden—PLANT—Marquardt Aviation Co., 16555 Saticoy St., Van Nuys, Calif., ram jet engine plant. $4,500,000.

▲ Wash., Anacortes—REFINERY—The Texas Co., 135 E. 42 St., New York, N. Y., oil refinery. $50,000,000. Work may start this summer.

▲ Wyo., Glenrock—STEAM POWER PLANT—Pacific Power & Light Co., 920 S.W. 6 Ave., Portland 4, Ore., 100,000 kw. steam power plant, near here. $23,000,000.

▲ Ont., Sarnia—PLANT—Imperial Oil Ltd., 445 S. Christina St., Plant to mfr. detergent alkylate. $3,800,000. To begin operation in mid 1957.

▲ Ont., Welland—PLANT—Welland Tubes, Ltd., c/o 100 Church St., Toronto, plant expansion to give mill an annual capacity of 20,000 tons of 20- to 36-in. diam. pipe for oil and gas transmission proj. $10,000,000.

▲ Que., Montreal—CEMENT PLANT—National Quarries, Ltd., 3701 Cote St. Michel Rd., cement plant, near quarry in suburban Ville St. Michel. $2,500,000 equipped.

UNCLASSIFIED

▲ Ky., Nicholson-Independence—RACE TRACK—Laxx Latonia Race Course, Inc., Alexandria, plans by John Billig, 180 Walnut St., Lexington, 1 mi. race track, clubhouse, grandstand, 20 stables, 32 stalls, 80 ft. wide mile track, 60 ft. course, parking area, $4,000,000, Edward Redman Jr., c/o Redman Construction Co. Alexandria, owner's engr. Constr. in the summer.

▲ Mich., Grand Rapids—STADIUM, etc.—City, Fred C. See, supt. Parks, 301 Market St. S. W., municipal stadium, also 3 recreation centers, two playgrounds, two baseball and two softball diamonds, $2,500,000; 3 skating rinks, artificial ice facilities, $200,000; aquarium, John Ball Park, $75,000. Raymond Bruggink, Jr., city engr. CD 2/9/53.

▲ Tex., Dallas—PARKS—City, City Hall, voted bonds Jan. 31, municipal parks. $2,600,000. CD 1/6.

(Proposal Advertisements see p. 85 to 87)

BIG NAMES

in road building and maintenance machinery help protect your profits with

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Universal Joints

J. D. Adams Mfg. Company
Allis-Chalmers Mfg. Co.
Austin-Western Co.
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Caterpillar Tractor Company
Elgin Sweeper Co.
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The Galion Iron Works & Mfg. Co.
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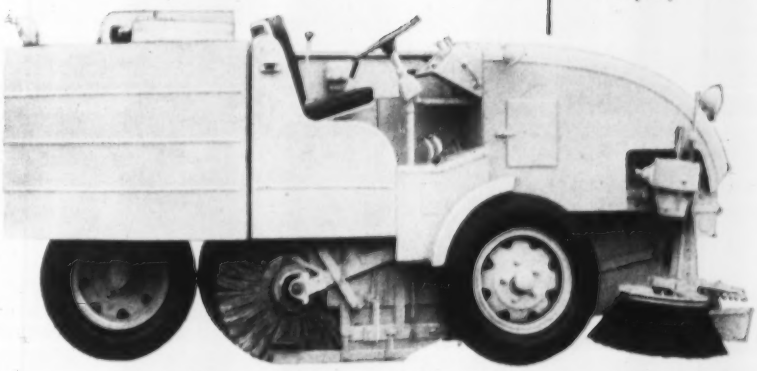

A number of Blood Brothers Universals are used on this Municipal Supply Co. Street Sweeper.

The Jaeger Machine Co.
Huber-Warco Co.
Meili-Blumberg Corp.
Municipal Supply Company
Tulsa Winch Division of Vickers, Inc.
Seaman Motors

These "big name" equipment builders strive constantly to give you equipment that's faster, more efficient—and more dependable too!

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Used on many moving parts—from hand controls to heavy-duty drive lines—Blood Brothers Universals take a power-packed beating. Their acceptance by the "big names" above is strong evidence that they stand up and deliver—through years of grueling service.

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ROCKWELL SPRING AND AXLE COMPANY
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Do it GIRAFFE with a GIRAFFE CEILING GRINDER

- **FASTER AND EASIER:** One man will average almost 4000 sq. ft. per day. Does not need scaffolding.
- **CHEAPER AND BETTER:** Money saved on finishing will help pay for grinding.
- **DEPENDABLE:** Individual GIRAFFES have worked more than 1,000,000 square feet without major overhaul.

GIRAFFE

Heights up to 24 ft.

Has been adapted to cleaning ceilings.

CONCRETE GRINDING CORP.
300 STRAIGHT ST. PATERSON, N. J.

Unit Prices

Four Oklahoma Turnpike Contracts Top Estimates

Contracts for 18.176 miles of subgrading and asphaltic concrete paving on the 88.5-mile Oklahoma Northeastern Turnpike total $2,746,739, an average of $151,119 per mile. This is 6.5% above the engineers' estimates.

The alternate calling for portland cement concrete pavement attracted only three bids, one that was 17.8% above the low bid and 14.6% above the high bid on asphaltic concrete surfacing on Contract 151 in Mayes County, and two on Contract 156 in Rogers County with the lower of the two 24.4% above contract price and 14.1% above the high bid on surfacing.

W. D. Hoback is chief engineer-manager of the Oklahoma Turnpike Authority. De Leuw, Cather & Co. are overall consulting engineers. Local engineers assigned to the individual sections include Cobb Engineering Co. for the Mayes County section, Hudgins-Thompson-Ball & Associates for Craig County, Wyatt B. Hendrick for a section located in Mayes and Craig Counties and Benham Engineering Co. for Rogers County.

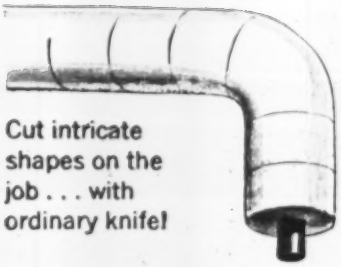
Minimum wage rates fixed by the Oklahoma Turnpike Authority include $1.00 per hour for skilled labor and $0.75 for intermediate and unskilled labor. All materials are furnished by the contractors.

The successful bidders on the four contracts are:

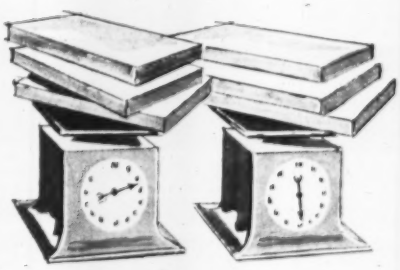
Contractor		Smith Bros. Constr. Co., Noble, Okla.		Peter Kiewit Sons' Co., Wichita, Kan.		Broce Constr. Co., Woodward, Okla.		Steinberg-Boyd Constr. Co., Tulsa, Okla.	
Contract Price		$809,919		$762,759		$791,985		$382,076	
Contract No. and county		151 Mayes		153 Craig		155 Mayes & Craig		156 Rogers	
Length		5.173 miles		5.189 miles		5.319 miles		2.515 miles	
Bids: 12-20-55 Items	Unit	Quantity	1C Unit Price	Quantity	1C Unit Price	Quantity	1C Unit Price	Quantity	1C Unit Price
Subgrade									
Excavation, roadway	cy	518	$0.75	517	$0.60	532	$0.75	252	$0.75
borrow	cy	5,463	0.75	5,459	0.60	5,617	0.75	2,656	0.75
Rolling	hr	109	2.00	109	2.00	123	2.00	53	2.00
Sprinkling	Mgal	164	1.50	164	1.75	184	1.50	80	1.50
Top soil, 4"	sy	2,732	0.07	2,730	0.07	2,808	0.07	1,328	0.07
6"	sy	46,586	0.11	46,481	0.11	47,744	0.11	22,579	0.11
Subgrade, 96.30', prepare	sta	273.17	40.00	272.95	55.00	280.85	40.00	132.82	40.00
Shoulders, prime matl	gal	16,945	0.13	16,923	0.13	17,413	0.13	8,236	0.13
asph binder	gal	29,518	0.13	29,479	0.13	30,332	0.14	14,347	0.13
cover matl	cy	1,203	5.00	1,201	6.30	1,236	5.00	585	5.00
Excav, struct, unclass	cy	20	2.50	20	2.30	20	2.50	20	2.50
Concrete, cl A	cy	8	50.00	5	50.00	5	50.00	5	50.00
CMP, galv, 18"	lf	50	4.00	50	4.00	50	4.00	50	4.00
24"	lf	50	4.50	50	4.50	50	4.50	50	4.50
Steel, reinforcing	lb	500	0.13	500	0.13	500	0.13	500	0.13
Pipe underdr, CM, non-perf, 8"	lf	259	2.00	258	3.50	266	2.00	128	2.00
perf, 8"	lf	259	2.00	258	3.50	266	2.00	128	2.00
cover matl	cy	96	3.50	96	3.50	99	3.50	47	3.50
Railing, galv iron pipe, 1½"	lf	25	7.00	25	7.00	25	7.00	25	7.00
Guard rail, met plate	lf	20,387.5	2.25	3,625	2.00	5,775	2.25	11,112.5	2.25
post, wood	ea	1,655	3.45	303	6.00	474	3.00	906	3.00
Guide posts	ea	24	4.00	14	7.00	24	4.00	10	4.00
End wing plates	ea	48	7.50	26	7.00	24	6.00	34	5.00
Bermuda slab sodding	sy	40,590	1.00	40,548	1.00	41,650	0.90	19,806	1.00
water	Mgal	1,944	2.00	1,941	2.00	1,994	2.00	948	2.00
sprigging	sy	517	0.07	517	0.06	532	0.07	252	0.07
water	Mgal	16	2.00	16	2.00	16	2.00	8	2.00
Fertilizer	t	5.2	100.00	5.2	100.00	5.3	100.00	2.5	100.00
Right-of-way markers	ea	138	3.00	129	7.30	140	3.00	70	3.00
Base course, shoulders, 6"	sy	72,894	1.00	72,798	0.85	74,902	1.00	35,428	1.00
Delineators, type A, shoulder	ea	275	7.50	274	7.60	282	6.50	127	4.00
type D, median	ea	138	17.00	138	19.50	141	6.50	66	6.00
type H, bridge	ea	16	8.50	12	9.70	12	8.00	12	7.00
type J, shoulder	ea	3	10.00	2	11.20			3	5.00
Striping, 6", broken line	mi	10.53	125.00	10.45	127.00	10.64	100.00	5.1	100.00
Subtotal of main bid, 1C			$211,887		$164,527		$172,841		$104,859
2	*		$206,619		$175,607		$172,153		$117,521
high bid & No. of bidders	*		(8) $231,193		(7) $183,342		(6) $205,654		(8) $104,237
EE			$202,776		$160,495		$170,274		$102,202
Surfacing, 5" Asphaltic Concrete Pavement									
Excav, borrow, median	sta	274.02	$48.00	273.42	$40.00	280.85	$40.00	133.55	$32.60
Matl, select, 12" x 97.74'	sta	273.35	323.00	272.95	425.00	280.85	390.00	132.82	320.00
Aggr base course, stablzd, 7"	t	63,406	2.75	63,355	2.75	65,188	2.75	30,834	2.75
Aggregates, type A	t	23,474	6.40	23,455	5.75	24,133	6.10	11,416	5.85
type B	t	15,126	6.40	15,104	5.80	15,521	6.10	7,372	5.90
Asphalt	t	2,550	26.00	2,547	25.00	2,619	26.00	1,242	25.00
Prime material	gal	68,292	0.13	68,238	0.16	70,212	0.13	33,204	0.13
Tack coat	gal	18	0.15	12	0.18			18	0.15
Subtotal Alternate 2, 1C			$598,032		$598,231		$619,143		$277,217
2	*		$612,705		$609,886		$620,838		$270,576
high bid & No. of bidders	*		(8) $609,708		(7) $649,721		(6) $659,035		(7) $303,030
EE			$553,481		$548,994		$564,698		$267,388

• * Second low and high bids on entire contract including subgrade and surfacing

Alternate Surfacing, 8" PCC Pavement (3 bids received, none from low bidders)



Cut intricate shapes on the job . . . with ordinary knife!



Versatile . . . available in densities from 2½ lbs. to 10½ lbs. per cu. ft.!

Can be removed for easy line inspection . . . replaced without damage, waste!

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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Mar 1—Clay Products, Lime, Plaster, Paint, Roofing, Wage Rates, Building Board, Lath, Insulation
- Mar 8—Cement, Aggregates, Ready-mixed Concrete, Asphalt
- Mar 15—Iron and Steel Products, Pipe

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SOUTHERN PINE AND DOUGLAS FIR

All Southern Pine is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2. Fir small timbers and timbers are No. 1. Lengths up to 20 ft.
(Prices in italics)

		1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	LONG LEAF Y. P. Merchantable grade up to 20 ft. 2x12 Rgh	12x12 Rgh	PLYWOOD Rail freight increment (See note for base price) ¼"	¾"
Atlanta	†	**$80.00**	**$82.00**	**$77.50**	**$76.00**	**$79.50**	**$83.00**	**$81.00**	.....	.....			$22.32	$27.24
Baltimore	*	**90.00**	**95.00**	**95.00**	**97.00**	**97.00**	**100.00**	**110.00**	.....	.....	**$170.00**	**$185.00**	25.92	31.60
		110.00g	*110.00g*	*125.00g*	*125.00g*	*125.00g*	*125.00g*	*130.00g*	*$140.00*	*$140.00*				
Birmingham	†	**81.50**	**83.50**	**80.50**	**87.50**	**90.50**	**95.50**	**100.50**	.....	.....	**115.00**	**160.00**	21.78	26.58
		105.00	*105.00*	*108.50*	*108.50*	*108.50*	*108.50*	*105.00*	*105.00*	*105.00*				
Boston	§	**108.00a**	**113.00a**	**110.00a**	**110.00a**	**110.00a**	**111.00a**	.....	.....	.....	.....	.....	25.92	31.60
		98.00n	*98.00n*	*123.00*	*123.00*	*123.00*	*123.00*	*130.00*	*130.00*	*133.00*				
Chicago	**	**101.00**	**104.00**	**97.00**	**112.00**	**120.00**	**121.00**	**116.00**	.....	.....	**144.00**	**144.00**	22.45	27.37
		107.00	*107.00*	*114.00*	*116.00*	*118.00*	*119.00*	*127.00*	*127.00*	*127.00*				
Cincinnati	*	**93.75**	**94.75**	**83.00**	**90.50**	**94.75**	**103.00**	**110.50**	.....	.....	**131.75**	**131.75**	25.00	30.48
		101.75	*104.00*	*115.50*	*115.00*	*116.50*	*116.75*	*140.00*	*140.00*	*140.00*				
Cleveland	**	**98.00**	**98.00**	**98.00**	**102.00**	**102.00**	**103.00**	.....	.....	.....	.....	.....	25.37	30.93
				111.00	*113.00*	*113.00*	*113.00*	*136.00*	*136.00*	*136.00*				
Dallas	k‡	**73.00**	**80.00**	**73.00**	**73.00**	**65.00**	**65.00**	**130.00**	.....	.....	**128.00**	**128.00**	18.72	22.80
Denver	*	*Not in stock*		*120.00*	*121.00*	*121.00*	*122.00*	*138.00*	*155.00*	*164.00*	.....	.....	13.92	16.98
Detroit	‡	**115.00**	**116.00**	**111.00**	**115.00**	**118.00**	**118.00**	.....	.....	.....	.....	.....	25.00	30.48
		125.00	*125.00*	*133.00*	*130.00*	*130.00*	*130.00*	*176.00*	*185.00*	*185.00*	.....	.....		
Kansas City	*	**130.00**	**130.00**	**125.00**	**130.00**	**135.00**	**145.00**	.....	.....	.....	.....	.....	16.56	20.16
		140.00	*140.00*	*140.00*	*144.00*	*144.00*	*148.00*	*165.00*	*185.00*	*210.00*	.....	.....		
Los Angeles	§	*111.00*	*111.00*	*111.00*	*111.00*	*111.00*	*111.00*	*153.00*	*153.00*	*153.00*	.....	.....	19.61*ab*	20.25*ab*
Minneapolis	#	*135.00*	*135.00*	*140.00*	*140.00*	*140.00*	*140.00*	*175.00*	*175.00*	*175.00*	.....	.....	19.89	24.25
Montreal	*ab*	**92.00**	**100.00**	**92.00**	**92.00**	**110.00**	**125.00**	.....	.....	.....	**105.00**	**105.00**	.....	.....
		170.00	*170.00*	*170.00*	*170.00*	*170.00*	*170.00*	*142.00*	*142.00*	*142.00*				
New Orleans	†	**102.00**	**102.50**	**94.50**	**87.00**	**92.00**	**96.00**	**120.00**	.....	.....	**152.00**	**152.00**	18.72	22.80
	†	*119.50*	*119.50*	*124.00*	*129.50*	*129.50*	*129.50*	*142.00*	*142.00*	*142.00*	.....	.....		
New York	§	**112.50**	**115.50**	**122.50**	**127.50**	**127.50**	**127.50**	**167.50**	.....	.....	**255/275**	**255/275**	25.92	31.60
		.....	.....	*135.00*	*137.50*	*137.50*	*137.50*	*165/175*	*170/180*	*170/180*				
Philadelphia	‡			**Range from $117.00 to $137.00**			**117/137**	**117/137**			**214/224**	**214/224**	25.92	31.60
				Range from $131.00 to $163.00			*131/163*	*156/158*	*158.00*	*158.00*				
Pittsburgh	†	**103.00**	**107.00**	**104.00**	**105.00**	**110.00**	**110.00**	**165.00**	.....	.....	**145.00**	.....	25.92	31.60
		130.00	*132.00*	*125.00*	*138.00*	*145.00*	*155.00*	*180.00*	*190.00*	*205.00*	.....	.....		
St. Louis	#	**124.00**	**126.00**	**130.00d**	**135.00d**	**135.00e**	**136.00e**	.....	.....	.....	.....	.....	18.72	22.80
				137/139	*140.00e*	*140.00e*	*141.00e*	*190.00e*	*190.00*	*185.00*	.....	.....		
San Francisco	A	*90.00*	*90.00*	*94.00*	*94.00*	*94.00*	*94.00*	*114.00*	*127.00*	*153.00*	.....	.....	12.22	14.91*a*
Seattle	†	*71.00*	*76.00*	*77.00*	*77.00*	*77.00*	*77.00*	*96.00*	*97.00*	*100.00*	.....	.....	.....	.....
Toronto	*a*	**108.00**	**109.00**	**104.00**	**104.00**	**106.00**	**107.00**	**116.00**	.....	.....	**113.00**	.....	.....	.....
		114.00	*117.00*	*131.00*	*131.00*	*131.00*	*134.00*	*149.00*	*147.00*	*147.00*				

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd., truckload lots, 5/6 M ft bm

LUMBER: Bold Face Type, Southern Pine. Italics, Douglas Fir. *a Spruce. *b Tax exempt. *c 5M lots. *d 8, 10, & 12 ft. lengths. *e 8 to 16 ft. lengths. *g No. 1 common. *j 8ft. lengths. *k No. 3 common. *n #3. A incl rail rate from North west mills to San Francisco are $11.50 to $15.00 per M ft. bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Interior Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ¼", $179.00; on ¼", $201.00. Exterior ¼", $199.00, ¾", $223.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a Lower rate by water shipment. *b 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950*a*
Single or Double Thickness

	A quality	B quality
Atlanta	79%	80%
Baltimore	74%*d*	76%*d*
Birmingham	82%	83%
Boston	72-10%	72-10%
Chicago	74%	74%
Cincinnati	74%	74%
Cleveland	74-2-10%	74-2-10%
Dallas	75%	75%
Denver	73%	73%
Detroit	74-10-10%	74-10-10%
Kansas City	76-10%	76-10%
Los Angeles	71%	78%
Minneapolis	73-10%	73-10%
Montreal	40-10-5%*bc*	40-10-5%*b*
New Orleans	76%	78%
New York	80%	80%
Philadelphia	77%	79%
Pittsburgh	78%	78%
St. Louis	76-10%	76-10%
San Francisco	61%	60%
Seattle	68%	71%

EXPLOSIVES

Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*

Atlanta	$0.2465
Baltimore	.2465
Birmingham	.1915
Boston	.2465
Chicago	.2465
Cincinnati	.2465
Cleveland	.2865
Dallas	.2540
Denver	.2515
Detroit	.2465
Kansas City	.2515
Los Angeles	.2490
Minneapolis	.2515
Montreal	22.05*h*
New Orleans	.2515
New York	.4125*g*
Philadelphia	.2465
Pittsburgh	.2465
St. Louis	.2515
San Francisco	.2465
Seattle	.2490

Price of 60% Ammonia Gelatin is $.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Glass: *a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c Single thickness. *d Discount 6/15/52. *e Discount eff. 12/31/54.

Explosives: * Cartridges of 1¼", 1½", 1¾", 2", 2¼", 2½", 3" diameters. Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h F.o.b Beloeil (near Montreal), per 100 lb. forcite, 40% Forcite 60%, $23.80

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me	$0.1915	$0.2265	$0.2465
W. o' Miss. to Rocky Mtn. States, Fla. and Maine	.1965	.2315	.2515
Rocky Mtn. States	.1965	.2315	.2515
Pacific N. W. States	.1940	.2290	.2490
Pacific S. W. States	.1915	.2265	.2465

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50/.58	....
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.78/.88	.93
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities

RAILWAY TIES

Prices f.o.b. per tie for carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'8" Untr.	7" x 8" x 8'8" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak		3.65*a*		4.40*a*
New York	S. L. Sap Pine	2.60	4.00	3.00	5.00
	Mixed Oak	2.50	4.50	3.50	5.50
Philadelphia	Red Oak	2.95/3.15	4.50/4.70	3.60/3.80	5.50/5.75
St. Louis	White Oak	2.50		2.80	
	Red Oak	2.40	2.95*a*	2.65	3.30*a*
	Sap Pine or Cypress		2.85*a*		3.25*a*
San Francisco	Douglas Fir	2.40*ef*	3.32*ef*	3.23*bf*	4.97*caf*

Tr.—Treated; Untr. Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell *e* Green. *f* f.o.b. cars. * Add 75*c*/tie freight charge to Birmingham.

CHEMICALS

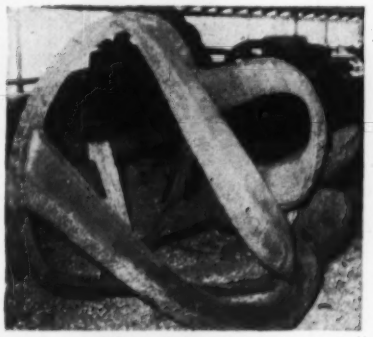
Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb.	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.103
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	29.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.70
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	14.90

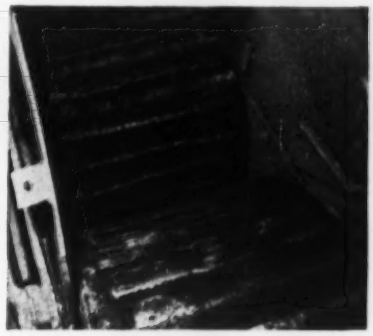
HOW TO GET LONGER LIFE AND MORE WORK
from your construction equipment

For over thirty years Stoody Hard-Facing Alloys have been accepted as the standard of wear protection, increasing overall equipment life and maintaining operating efficiency. Hard-facing procedures developed by Stoody are thoroughly field tested and proven under actual working conditions in mines located all over the globe. For all-around dependability and maximum wear resistance, no better hard-surfacing materials are made. Use Stoody and you use the best!

POWER SHOVEL BUCKETS are kept in top condition by applications of Stoody 21. Note use of stringer beads on all wearing surfaces.



DREDGE PARTS such as the cutter head illustrated, as well as impeller hubs and vanes can be prolonged by hard-facing wearing areas. The part above hard-faced with Stoody 21 outlasted 6 unprotected cutter heads.



CRUSHER ROLLS are easier to maintain with the new Stoody Alloy Tubular Wires applied semi-automatically. Welding is several times faster than with manual electrodes, depositing 7 to 15 pounds of metal per hour.

DIAMOND CORE DRILLING EQUIPMENT including core barrels, flutes and reamers produce more hole when protected with Acetylene Tube Borium. Footage of typical sampling drills was increased from 400-500 feet to 2000-3000 feet in one drilling operation.

CRUSHER JAWS are most efficiently rebuilt with Stoody Manganese and corrugations hard-faced with Stoody 100—both materials are available in the new Stoody Alloy Tubular Wires for semi-automatic welding.

SWING HAMMERS such as this soon lose corners and edges from severe impact and abrasion. Rebuilt with Stoody Nickel Manganese and topped off with a final pass of Stoody 21, life is increased 2 or more times.

You'll find the Stoody Guidebook chock full of ideas for prolonging life of fast wearing mining equipment by hard-facing. Ask your Stoody Dealer for a copy or write direct!

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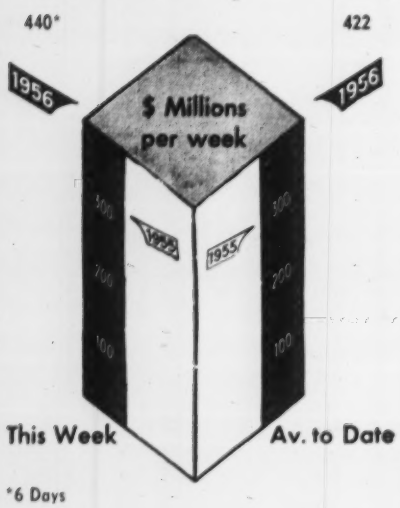
SEE THE STOODY EXHIBIT—WELDING SHOW, BUFFALO, N. Y., May 9-11

Construction Scoreboard

Contract Awards



*6 Days

AMOUNT OF CONTRACTS LET

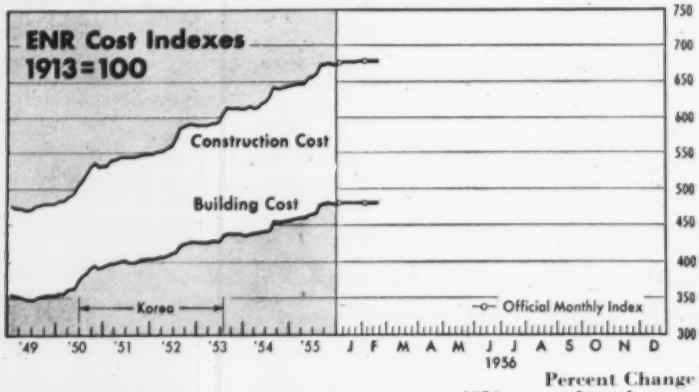
By Ownership	This Week*	Cum. 8 wks 1956	Chge %
	$ millions		
Federal	$29.4	$317.4	+19
State and Municipal	117.8	946.0	+49
Total Public	147.2	1,263.4	+40
Total Private	292.8	2,110.6	+43
U. S. Total	$440.0*	$3,374.0	+42
By Type of Work			
Waterworks	$4.5	$45.0	−9
Sewerage	4.2	136.7	+140
Bridges	11.3	88.0	+15
Highways	41.8	304.3	+27
Earthwork, Waterways	20.9	105.7	+76
Buildings:			
Public, Excl. Hsg.	32.4	298.7	+27
Public Housing	10.5	72.9	+811
Private Housing	138.6	990.1	+13
Commercial	37.3	391.6	+113
Industrial	96.9	636.2	+82
Unclassified	41.6	305.8	+25
U. S. Total	$440.0*	$3,374.0	+42

*6-Day week

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

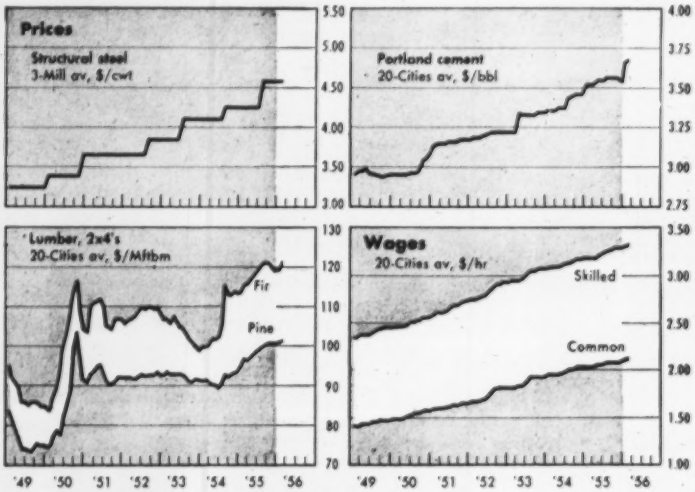
	Week of Feb. 16	Cum. 7 wks 1956	Chge '55-'56 %
	$ millions		
Corporate Securities	$102.5	$303.4	−63
State and Municipal:			
All Except Housg.	74.8	490.3	−2
Housing	11.6	18.1	−44
Federal Loans	2.5	12.4	−17
Federal Aid	...	...	...
Total Nonfederal	$191.4	$824.2	−12
Federal Appropriations:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total New Capital	$191.4	$824.2	−12



ENR INDEXES (1913 = 100), 20-cities' average	1956 Feb. 16	Percent Change from last Month	Year
Construction Cost	680.01	+0.1	+5.3
Building Cost	482.88	0	+5.0

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.845. To convert to 1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518.

ENR COST INDEX COMPONENTS



ENR COST INDEXES IN 22 CITIES, 1913 = 100

City	Construction Cost 1956 Feb.	% change from Month	Year	Building Cost 1956 Feb.	% change from Month	Year
Atlanta	502	+0.8	+5.9	424	+0.5	+6.1
Baltimore	591	−0.2	+2.8	472	−0.2	+4.5
Birmingham	546	+1.9	+6.9	443	0	+4.7
Boston	714	+0.7	+5.7	493	+1.0	+7.3
Chicago	769	+0.6	+4.5	493	+0.9	+5.1
Cincinnati	674	0	+4.9	469	0	+5.0
Cleveland	783	+0.6	+3.8	487	+1.0	+4.2
Dallas	512	+0.3	+5.8	428	+0.4	+6.3
Denver	655	+0.2	+3.1	486	+0.3	+3.3
Detroit	777	+0.2	+4.5	503	+0.3	+4.6
Kansas City	707	+0.4	+4.6	499	+0.5	+4.3
Los Angeles	719	+1.5	+7.7	490	+2.3	+8.5
Minneapolis	721	0	+3.5	503	0	+2.2
New Orleans	549	+0.5	+5.2	453	+0.6	+5.2
New York	813	0	+8.9	551	0	+3.8
Philadelphia	722	0	+3.7	536	0	+3.0
Pittsburgh	688	−1.2	+5.2	500	−1.5	+5.2
St. Louis	757	+0.8	+9.5	523	+2.1	+8.8
San Francisco	691	+0.7	+6.2	470	+1.1	+5.8
Seattle	715	+3.8	+5.7	439	+1.8	+6.1
U.S.—20 cities' avg.	**680**	**+0.6**	**+5.4**	**483**	**+0.5**	**+5.1**
Montreal	550	0	+4.2	427	0	+4.6
Toronto	569	+1.6	n.a.	457	+1.9	n.a.

For record of ENR cost indexes for preceding years see folded insert chart ENR September 29, 1955. Extra copies of chart are available at 50 cents.

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Selecting the right pipe material for a new sewage system—or for additions to an existing one—is a problem of major importance to *all* concerned in influencing a choice. *And* it can be solved to *the complete satisfaction of both installer and user* with economies in each of these stages—(1) system design (2) installation (3) operation and (4) maintenance.

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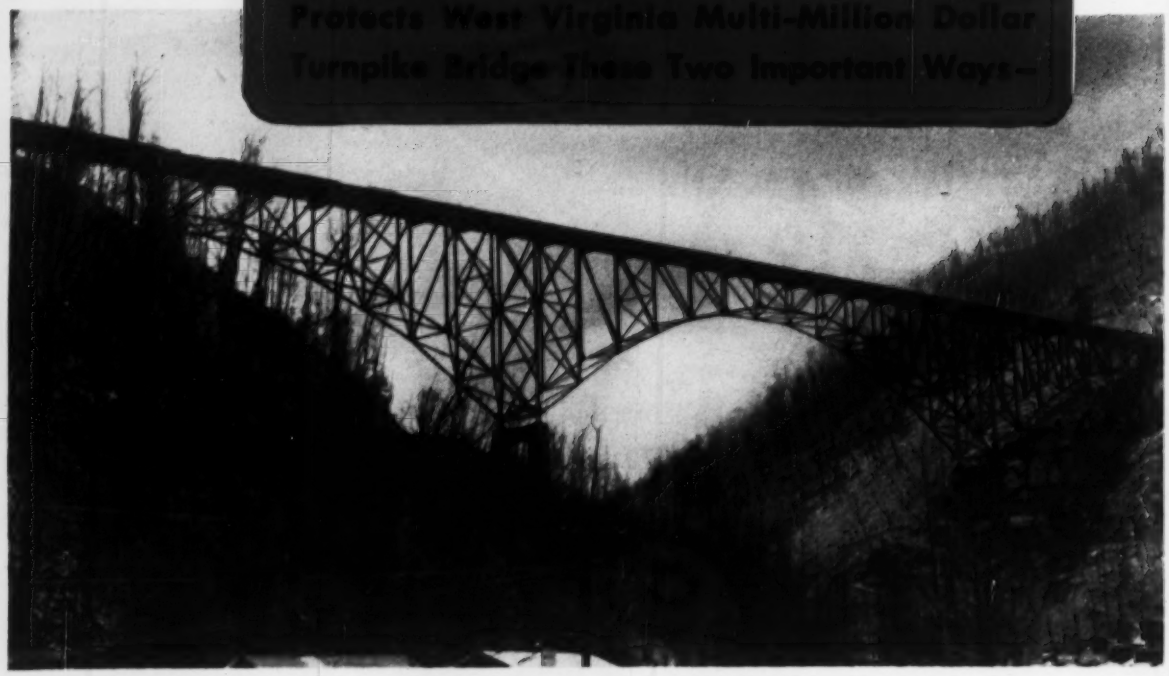

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2. Makes an excellent foundation coat for field painting

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Steel work, fabricated by the American Bridge Division, United States Steel Company, was shopcoated with X-L-O Primer. This unusual material, derived from linseed oil, is available in combinations of red lead and iron oxide, or with 100% red lead.

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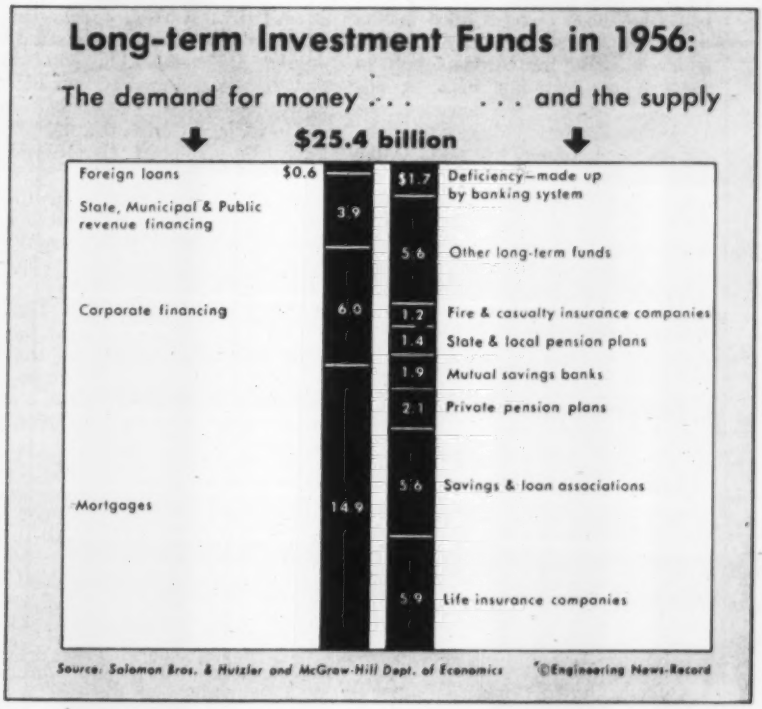


THE LONGER LOOK:

Money will be ample for most construction needs in 1956, but interest rates will remain close to present levels

The availability and price of credit shape up as key factors in the outlook for construction—and particularly for housing—in 1956.

Last year the shift from extreme looseness to severe tightness in the mortgage money market put a damper on the biggest homebuilding boom since 1950. This year it would take a sharp reversal to keep housing starts close to last year's 1,330,000. And other sectors of construction may feel some pinch, too.

No shortage in the over-all amount of funds available for construction seems likely this year, but the price probably will remain high—unless the economy as a whole runs into a serious slump. For homebuilders, there is the additional consideration of the attitude of government agencies toward mortgage terms, an area where some relaxing has occurred already.

• **Demand for funds**—In the competition for credit, construction must vie with users of short-term as well as long-term credit. Last year, for example, consumer credit siphoned off nearly $6 billion of the total net increase in borrowed money. But funds from some sources normally go into long-term investments such as mortgages and bonds. For these funds, which provide the bulk of construction money, competition is more limited, though it is never entirely insulated from the general money market.

Demand for long-term investment funds in 1956 has been estimated as follows by Girard L. Spencer, of Salomon Bros. & Hutzler (members of the New York Stock Exchange):

Mortgages—Gross mortgage requirements will be $22.8 billion for 1-4 family housing and farm and commercial property. Amortization and repayments of $7.5 billion and FNMA purchases of $0.4 billion are anticipated, leaving a net need for $14.9 billion.

Corporate financing—Net increase expected is $6 billion, made up of $4.4 billion in bonds and $1.6 billion in preferred and common stock. (Most corporate money for plant and equipment, however, comes from depreciation and retained profits rather than new borrowing.)

State, municipal and public revenue financing—Net increase of $3.9 billion is estimated.

Foreign Loans—International Bank, Canadian and other foreign securities should account for a net demand of only $600 million.

• **Supply of funds**—Long-term funds come mostly from savings, insurance companies and pension funds. Spencer estimates available funds for 1956 this way:

Life insurance companies—Assets will rise about $6.4 billion, but $500 million is expected to go into real estate investment and policy loans. The net rise available will be $5.9 billion.

Fire and casualty insurance companies—These will provide another $1.2 billion in long-term funds.

Pension plans—Private plans not funded with insurance companies will have $2.1 billion and state and local plans another $1.4 billion (after deducting an estimated $300 million for U. S. Treasury issues).

Savings and loan associations—These heavy mortgage investors will have $5.6 billion more in 1956.

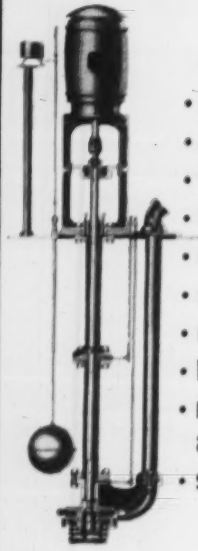
Mutual savings banks—Another $1.9 billion.

Other long-term funds—A total of $5.6 billion will be derived from individuals, personal trust funds and charitable and educational endowments.

To balance the demands for long-term investment funds in 1956—which total $25.4 billion—Spencer estimates that the commercial banking system will be called on to supply $1.7 billion. This is a considerably smaller deficiency than the banks met in 1955, so no strain is expected.

• **Price still high**—Although the supply of credit is expected to be larger in 1956 than it was toward the end of 1955, there seems little prospect of any significant drop in interest rates. Mortgage rates are fairly sluggish compared to the fast-moving, sensitive rates on government securities and Federal Reserve discounts on bank loans. And there has been little disposition in Washington to let these rates drop while some threats of inflation remain.

The discount rate—which is the rate banks must pay when they borrow from Federal Reserve banks—has held at 2½% since last fall and has pushed



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the banks' own prime rate up to 3½%. So far, any easing of money to the banks has been through open market operations in government securities, which increase the banks' supply of money but does not make it any cheaper.

For the money market as a whole, the picture is about the same. More funds will be available than last year, but there is nothing yet in sight to make it cheaper. There seem to be enough takers at present rates to prevent any spontaneous collapse in long-term rates. At the same time, rates are high enough to choke off the additional demand that would put a strain on available funds.

City Fights Ruling

Court upholds contractor on $589,000 bid error

The city of Baltimore, Md., will appeal a city Circuit Court ruling that would permit the DeLuca-Davis Construction Co. to correct a $589,000 error in its low bid for the first major section of the $70-million Jones Falls Expressway.

Circuit Judge Reuben Oppenheimer declared that the fact that the DeLuca-Davis bid of $1,796,000 was "drastically below" bids from eight competitors (and the $2.5-million estimate of city engineers) "should have put reasonable men on notice that something was substantially wrong."

He held that the contractor's error, made in transferring excavation cost figures from one work sheet to another, was made in "absolute good faith."

Soon after the judge handed down his decision, Mayor Thomas D'Alesandro, Jr., ordered city legal officials to appeal the decision to the Maryland Court of Appeals, the state's highest court.

The mayor's order came after the city solicitor, Thomas N. Biddisen, argued that the judge had "departed from the established law of the state" in reaching his decision.

Biddisen said that without reflecting on the DeLuca-Davis company, he was opposed to the ruling because "the potential for fraud, finagling and collusion" would be great if contractors were permitted to change original bids.

Biddisen said the decision would permit "anyone" to submit extremely low bids on city work, then later raise the bid to within a few dollars of the second low bidder.

• **Delays start of work**—The city's decision to appeal Judge Oppenheimer's ruling will delay the start of construction of a 2,500-ft conduit to cover the Jones Falls as it passes under a number of major north-south bridges, carrying regular city traffic. The 100-ft roadway for the expressway will be built atop the conduit.

However, the city's director of public works, George A. Carter, said the court fight will not prevent the city from going ahead with reconstruction of the Calvert Street bridge, a high-priority item in the expressway program.

• **The missing figure**—The DeLuca-Davis troubles came to light Jan. 25 when bids were opened on the first section of the expressway. Eight competitors were obviously startled when the DeLuca-Davis bid was called out. Employes of the firm did a quick recheck, discovered their bid should have been $2,385,944 instead of the $1,796,064 submitted.

The company quickly filed suit in equity asking Judge Oppenheimer to either (1) withdraw its bid and take back its $50,000 check, or (2) to amend its bid to take cognizance of the error. The judge would not permit withdrawal of the bid but agreed to hear arguments on the plea to amend the bid.

During the testimony, Harry J. Peyton, an engineer-estimator, told the court he copied an incorrect figure from his work sheets onto a summary sheet. He introduced the work sheets in evidence. The error: He had estimated excavation at $13.34 a yd but carried forward a figure of only $3.34.

The president of the construction company, D. A. Davis, testified in court that he had checked the original estimate of $13.34 a yd for excavation and had approved the figure. But, he added, the routine of filling out the papers for the bid was left to his employes.

For several years, Baltimore has followed a strict policy making it difficult for bidders to withdraw their offers. If a contract is offered to a low bidder and he refuses to accept it, he must forfeit his performance check. The city then advertises for new bids.

During the past year, several contractors have had to forfeit performance checks in this manner. But none of the checks amounted to more than $5,000—as against the $50,000 involved in the DeLuca-Davis case.

Harry N. Baetjer, the DeLuca-Davis attorney, argued that the city "should not be allowed to take advantage of one of its citizens" because of the mistake.

(B&F continued on page 82)

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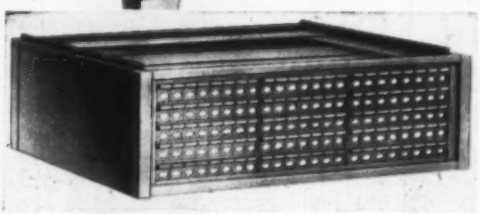

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Complete information on many water storage reservoirs constructed or restored by Cement Gun Company are illustrated and described in our latest catalog, together with many other types of "Gunite" work we have done. A request, on your letterhead for catalog A3000 will bring your copy by return mail.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.

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. . . Business and Finance

Business Briefs . . .

• **Canadian costs rise**—After two years of relative stability, construction costs in Canada are pushing upward about as fast as in the United States. In the first 11 months of 1955, residential building costs increased 3.6%; nonresidential building costs, 4.1%, according to the Central Mortgage and Housing Corp. of Ottawa.

• **Atoms round the world**—The U. S. firm of A. M. F. Atomic, Inc., of New York, and the British firm of Mitchell Engineering Ltd., have reached a joint agreement for design and construction of nuclear power plants throughout the world. Both the AEC and its British counterpart had to approve the exchange of information essential to the agreement.

• **Housing starts perk up**—Private housing starts of 73,000 in January were up 1% over December, according to the Bureau of Labor Statistics. But the figure was 16% below January '55.

• **Bond proposals approved**—Voters agreed to spend $211.5 million for public improvements in January, and turned down bond proposals valued at only $10.6 million. Major issues included $75 million for Missouri penal and charitable institutions, and schools; $25 million for Kansas City, Mo., water projects; $21.5 million for various local improvements in Houston, Texas; $10 million for projects of the San Antonio River Authority, Texas.

• **Copper price boosted**—The Anaconda Co., largest U. S. producer of copper, last week boosted the price of the metal another three cents a pound. The new quotation—46 cents a pound—is the highest since January 1865. The latest price jump puts the U. S. price closer to the world market price than at any time in recent years.

• **New source for housing funds**—Mass homebuilder William J. Levitt last week told a Congressional committee the government should encourage use of employe pension funds to meet the "desperate" needs of the building industry for new sources of mortgage money. He estimated that pension funds now have $15 billion at their disposal. Said Levitt: "If 10% of the pension funds were invested in FHA-insured and VA-guaranteed mortgages, we would never again have a Congressional hearing on the availability of mortgage money."

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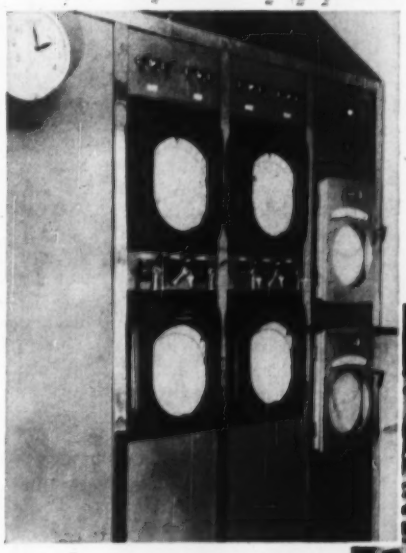

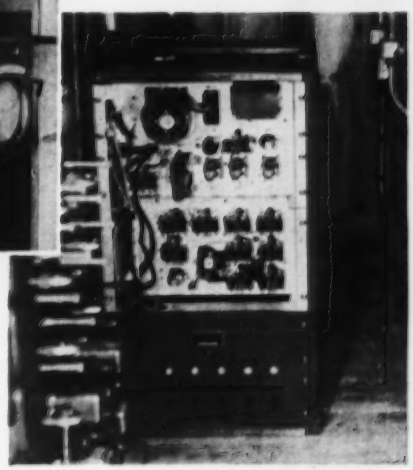

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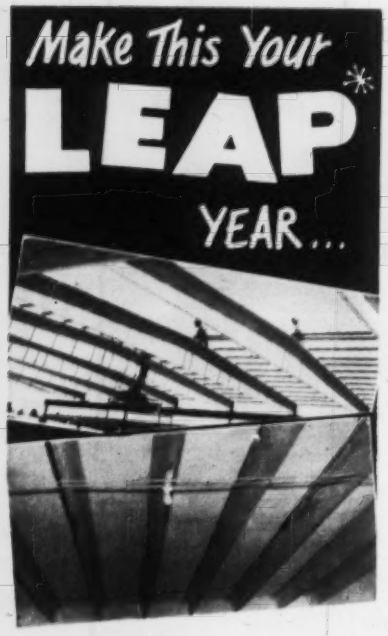

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AGC Looks at Labor Problems

The Associated General Contractors of America, Inc., continued its search last week for ways and means to cope with—if not to solve—some of the challenging and touchy labor problems confronting the construction industry.

Meeting in New York for its 37th annual convention (see page 21), the AGC:

- Vigorously opposed extension of prevailing wage requirements to the proposed federal highway program.
- Urged greater membership participation in the association's accident prevention program.
- Recommended formation of an apprenticeship department within the AGC and a new program of merit awards to promote and encourage greater interest in the further development of apprentice training.
- Went on record against any compromise of the "principle of construction by contract" in the dispute between the building trades and industrial unions over allocation of industrial work.
- Offered to cooperate with all employers in building a united front to resist unreasonable union demands.
- Commended the work of the National Joint Board for the settlement of jurisdictional disputes, and urged members to follow carefully the dictates of the board in making work assignments.

With continued improvement in union-contractor relations as one of its major goals, the AGC necessarily found some of the problems easier to deal with than others. And lending added interest to the convention discussions was the fact that the AFL-CIO Executive Committee, simultaneously winding up its first session in Miami, had some of the same problems in its own hopper.

• **Voluntary solutions**—In several instances, the AGC approach was based on the proposition that adequate voluntary solutions are often the best way to avoid further government regulation. Again, the theme song was this—"What we all want is less government control of our businesses."

This was one of the pegs—along with reducing human suffering and cutting construction costs—on which the plea for greater participation in the AGC accident prevention program was hung. Although the number of cooperating members has jumped from 2.3% in 1941 to 33.5% in 1955, members were warned that the "only real defense . . . against extension of governmental regulation in the field of industrial safety is proof we have an adequate voluntary program under way."

In the discussion of prevailing wages, it was evident that some of the things that have soured contractors on the Davis-Bacon Act are the red tape involved and the headaches imposed. Many feel that the Labor Department, for example, through wage determinations—often containing what some contractors view as misclassifications—is taking over the employer's job of making work assignments. Asserting that "the contracting industry has no inclination to pay workers less than standard wages," the AGC adopted a resolution against putting any wage requirements in federal highway legislation. And a special subcommittee has been appointed to seek the support of building contractors.

The industry's Jurisdictional Disputes Board was singled out for warm praise as an example of voluntary settlement in operation. The contribution which it has made to the elimination of jurisdictional work stoppages was stressed by guest speaker T. C. Kammholz, NLRB general counsel, as well as by the AGC labor committee. Now in its eighth year, the agreement under which the board operates is up for renewal March 31.

• **Industrial construction**—Mindful of the present contest between the building trades and industrial unions over industrial construction and maintenance work, the AGC, in effect, gave its moral support to the building trades. Although the solution eventually lies with the unions themselves, the AGC went on record against cutting any of the ground out from under the traditional principle of construction by contract.

In his address to the convention, Maurice Hutcheson, president of the carpenters union, significantly avoided any reference to the Studebaker-Packard dispute (ENR Feb. 16, p. 279). But he expressed the "firm belief" that union discussions "will guarantee to the building and construc-

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330 W. 42nd St., New York 36, N. Y.

. . . Labor

tion trades their rightful jurisdiction."

Meanwhile, UAW's Walter Reuther and the building trades' James Hoffa, with the help of AFL-CIO president George Meany, reached a truce in the Detroit dispute, leaving the general issue still unsolved. The disputed conversion work will be performed by UAW mechanics and, until the joint union committee meets again in March, the building trades and industrial unions will try to agree on work assignments prior to execution of new conversion contracts.

• **Union demands**—Fearful that the strength gained by labor through the AFL-CIO merger may result in excessive demands, the AGC looked to unity among employers as a possible balance wheel. It urged member firms and chapters to cooperate with other employer organizations, both national and local, in combining their efforts to keep labor demands within reason.

At the same time, the AFL-CIO served warning from Miami that labor would press again this year for substantial increases in basic rates and fringe benefits—not only to enable our purchasing power to support a strong economy, but also to give workers a fair share of the fruits of industrial progress.

Attention was also directed at the AGC convention toward further stabilization of labor costs. Emphasis was placed on the benefits that flow from long-term contracts, generally considered well worth their cost. Members were cautioned not to fritter away the stability thus achieved, however, by agreeing to interim changes.

• **Apprenticeship**—The AGC found little to crow about when it turned to the perennial problem of apprentice training, described as "bread and butter" to the industry.

Although the number of enrolled apprentices has increased slightly since July 1, 1955, the number falls far short of the necessary goal.

In an effort to encourage voluntary participation in training programs, the AGC apprenticeship committee came up with two suggestions, both of which were referred to the executive committee. One is the formation of a Department of Apprenticeship in the national AGC office. Its responsibility would be to conduct a promotional program on the national level and to assist local chapters and branches in strengthening their own programs. The other suggestion was for a system of merit awards to members and joint committees that chalk up the best record in training apprentices.

OFFICIAL PROPOSALS

Bids: March 6, 1956

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF
WATER FACILITIES FOR ALCOA AND MASSENA
NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATIONS NO. PA-5-11005
ST. LAWRENCE CONTRACT NO. 20

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Water Facilities for Alcoa and Massena near Massena, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 6th day of March, 1956, 270 Broadway, Hearing Room 'C' on the 6th floor, New York, New York.

(2) If mailed in until 10:15 A. M. Eastern Time on the 6th day of March, 1956, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are:

Estimated:

115,200 cu. yd. Excavation Common
11,380 lin. ft. Reinforced concrete pipe-steel cylinder type, prestressed, 48 inch diameter
8,560 lin. ft. Reinforced concrete pipe-steel cylinder type, prestressed, 36 inch diameter

The work shall be completed on or before October 1, 1956.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue Toronto 2, Ontario, may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set and Five ($5.00) dollars per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN,
GENERAL MANAGER

PA-5-11005
2/8/56

U. S. Government

Sealed bids for the purchase of floating equipment offered for sale by Panama Canal Company will be received in the office of Procurement Officer, 21 West Street, New York 6, N. Y., until 10:30 A.M., E.S.T., April 6, 1956, and at that time publicly opened. This equipment, covered by Invitation No. 235, consists of hydraulic grader, air compressor barge, relay pump barge, and one 1200 ton silt barge. If complete brochure and bid forms are desired, contact Procurement Officer, Panama Canal Company, 21 West Street, New York 6, N. Y. BO 9-5380.

SEARCHLIGHT SECTION

OFFICIAL PROPOSALS

Bids: March 8, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 8th day of MARCH 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

Contract No.	County	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
M.T. 56-3	Herkimer	New York State Thruway Mohawk Section, Sub. 10B (Herkimer Maint. Bldg. "G" Site)	....	Grading, Paving and Misc. Work	$1,800 Plans $10	$34,000
M.T. 56-2	Montgomery	New York State Thruway Mohawk Section, Sub. 15 (Amsterdam Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$3,100 Plans $10	$58,000
M.T. 56-4	Oneida	New York State Thruway Mohawk Section, Sub. 4 (Verona Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$3,600 Plans $10	$67,000
DISTRICT No. 3, WM. ROBINSON, District Engineer, Weigh Lock Bldg., Syracuse, N. Y.						
O.T. 56-1	Cayuga	New York State Thruway Ontario Section, Sub. 5A (Weedsport Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$2,500 Plans $10	$45,000
DISTRICT No. 4, B. F. PERRY, District Engineer (Acting), Barge Canal Terminal, Rochester, N. Y.						
O.T. 56-4	Genesee	New York State Thruway, Ontario Section, Sub. 4 (Batavia Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$3,000 Plans $10	$56,000
O.T. 56-2	Monroe	New York State Thruway, Ontario Section, Sub. 9 (West Henrietta Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$3,600 Plans $10	$71,000
O.T. 56-3	Ontario	New York State Thruway, Ontario Section, Sub. 14 (Manchester Maint. Bldg. Site)	....	Grading, Paving and Misc. Work	$1,700 Plans $10	$32,000
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
NET 56-1 FA NET 56-2 ST 56-3 FAST 56-4 RC 56-1	Westchester	New York State Thruway—New England Section, Sub. No. 3 (Chatsworth Ave.—Mamaroneck Ave.); Weaver St. Pt. 1, S.H. 1645 and 7 Secondary Cross Roads Project F-1068(10)	2.49 (3.05 Acc.)	9" Cem. Conc. Pavt. 2 at 37' Var. Wide=4.59 Mi. Asp. Conc. Opt.—0.95 Mi. 8 Hy. Sepa. Comp. I-Beam 107.8', 110.2', 109.3' 107', 112.3', 124.5', 120.3' and 202.7' 1 RR Sep. Comp. I-Beam 55.3' 4 Brs. Conc. Boxes 36', 36', 36' & 54'	$420,000 Plans $100	$7,600,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: April 5, 1956

City of Nashville, Tennessee

OFFICE OF PURCHASING AGENT
NOTICE TO CONTRACTORS
BIDS FOR PROJECT NO. 56-SD-1
NASHVILLE, TENNESSEE

Sealed proposals or bids will be received by the City Purchasing Agent of the City of Nashville, Tennessee, at Room 209 Courthouse—City Hall Building, until ten (10) o'clock A. M., on the 5th day of April, 1956 for furnishing of all materials, labor, tools, and appliances necessary for construction of:

SEWAGE TREATMENT PLANT
BUILDINGS, STRUCTURES AND
EQUIPMENT

Copies of the proposal, contract documents, plans and specifications, may be obtained from and upon advance payment of charge for same to the office of George P. Rice, Consulting Engineer, 1123 Church St., Nashville, Tennessee, or 400 Audubon Building, New Orleans, Louisiana.

A charge of ONE HUNDRED—($100.00) —DOLLARS will be made for each set of contract documents, proposal, plans and specifications. Deposit will be refunded in full amount applicable to the first set obtained and returned by contractors submitting a bona fide bid. Deposit, less one-half principal sum thereof retained to cover cost of production and handling, will be refunded on all other sets returned within ten (10) days after opening of bids.

Each proposal or bid must be accompanied by a cashier's or certified check on a State or National Bank made payable to the City of Nashville, Tennessee, or a bidding bond executed by the bidder and a surety company authorized to transact business in the State of Tennessee, in the sum of not less than five (5%) per cent of the total amount of the bid. Said check or bond will be returned to the unsuccessful bidders as soon as contract has been awarded and to the successful bidder as soon as he has executed the contract and furnished the necessary bonds, and the same have been approved by the City Attorney and the contract has been executed by the City.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee. Bidder's name and license number must be placed on the sealed envelope containing these documents.

All bids must be made out on proposal form bound in the specifications. No interlineations, additions or deletions shall be made in the proposal form by bidder. The proposal form must not be detached from the specifications.

The City of Nashville, Tennessee, through its Mayor, reserves the right to reject any and/or all bids, to waive any informalities in the bids received and to accept any bid, which, in its opinion, may be for the best interest of the City.

E. B. Smith, Purchasing Agent
The City of Nashville, Tennessee

Bids: March 8, 1956

Contract No. 32

DELAWARE INTERSTATE HIGHWAY
DIVISION
NOTICE TO BIDDERS
BRIDGE AND ROADWAY MODIFICATIONS
FOR DELAWARE MEMORIAL BRIDGE
AND APPROACHES

Sealed proposals for the construction of bridge and roadway modifications along the approaches to "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware Interstate Highway Division at the Administration Building, Delaware Memorial Bridge near Wilmington, Delaware, until 12 o'clock noon Eastern Standard Time, March 8, 1956, at which time and place said proposals will be opened and read.

The work to be performed under this Contract includes the furnishing of all plant, equipment, materials, labor and all else necessary for the construction of (a) installation of expansion joints and the construction of adjoining slab sections in the concrete pavement adjacent to both abutments of the Delaware Memorial Bridge, the Pennsylvania Railroad Overpass, the New Castle Avenue Overpass and the North and West Bridges of the Farnhurst Interchange, and adjacent to the east abutment of the East Bridge of the Farnhurst Interchange; (b) macadam paving of both outside shoulders for certain lengths adjacent to all the abutments specified in (a) above except those of New Castle Avenue Overpass; (c) repair of roadway expansion joints at both towers of the Delaware Memorial Bridge; and (d) repair of the southwest link of the west tower.

Work on Contract No. 32 shall begin promptly after the execution of the Contract and shall be completed on or before June 15, 1956.

Monthly payment will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Division.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Plans and Specifications and other contract documents may be examined after February 13, 1956, at the Administration Building of the Delaware Memorial Bridge in New Castle, Delaware. Contract documents may be obtained from the Delaware Interstate Highway Division upon payment of Ten Dollars ($10.00) for each set. Checks shall be made payable to Howard, Needles, Tammen & Bergendoff. Contract documents need not be returned and the above payment will not be refunded.

DELAWARE INTERSTATE HIGHWAY
DIVISION
by: Garrett E. Lyons, Director
W. B. McKendrick, Jr., Chief Engineer
Delaware Interstate Highway Division

February 9, 1956

U. S. Government

Invitation for bids (Construction Contract) Date, February 3, 1956. Name and location of project, Project number 53-106R Waterfront Roadway, St. Thomas, Virgin Islands. Department or agency Government of the Virgin Islands by (issuing office) department of Insular Affairs, Division of Procurement and Supply, Charlotte Amalie, St. Thomas, Virgin Islands. Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 3:00 P.M., Atlantic Standard Time, March 28, 1956 in the Department of Insular Affairs, Division of Procurement and Supply, Charlotte Amalie, St. Thomas, Virgin Islands, 75 Kronprindsens Gade, (opposite of the Catholic School) and then publicly opened. Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other contract documents are open for public inspection at the office of the Public Works Commissioner, Charlotte Amalie, St. Thomas, Virgin Islands; R. L. Kenan & Associates, Consulting Engineers, Bell Building, Montgomery, Alabama; Lester M. Marx, Deputy Public Works Advisor, Office of Territories, Department of the Interior, Room 2713, Interior Building, Washington 25, D. C.; A.G.C. Office, 1113 Congress Building, Miami, Florida; Builders Exchange, 46 Northeast 6th Street, Miami, Florida; Urban Renewal Administration, 2nd Floor, del Valle Building, Santurce, 17, Puerto Rico; and F. W. Dodge Corp., 119 West 40th Street, New York 18, N. Y. Plans and specifications may be procured from the Office of R. L. Kenan & Associates, Consulting Engineers, Bell Building, Montgomery, Alabama, upon deposit of $20.00. Deposit shall be only by certified check payable to R. L. Kenan & Associates, which will be refunded to bona fide bidders upon the return of plans and specifications in good condition within sixty (60) calendar days from the date of bid opening. A bona fide bidder includes any person who submits a bid for a general contract, but does not include a person who submits a quotation to the general contract bidders. To persons who procure plans and specifications upon payment of $20.00 and who do not submit a bid, $15.00 will be refunded upon the return thereof in good condition within sixty (60) calendar days from the date of bid opening. No refund will be made for return after that time. After the bid opening additional copies of plans and specifications may be obtained from the Consulting Engineers at commercial rates, plus handling and mailing charges. Bonds, etc. Each bid must be accompanied by a satisfactory bid guaranty in an amount not less than 5 per cent of the total bid. The successful bidder will be required to furnish a performance bond and payment bond, each in the amount of 100 percent of the contract price. No bid may be withdrawn until forty-five (45) calendar days after the scheduled closing time for the receipt of bids. The Government of the Virgin Islands reserves the right to award a contract for any or all items of any bid, whichever course is in the best interests of the Government of the Virgin Islands. Description of Work. The construction of a roadway approximately 7,830 feet long along the seawall in Charlotte Amalie harbor which includes: 13,500 C.Y. common excavation, 4,700 C.Y. solid rock excavation, 1,434 L.F. culvert pipe, 38 Ea. roadway inlets, 12,900 L.F. standard combination curb and gutter, 280 C.Y. rubble masonry curb wall, 2,460 S.Y. grouted riprap, 6,330 S.Y. concrete sidewalk, 25,700 S.Y. dry macadam base course, 25,700 S.Y. 2" bituminous surface, 4 Ea. comfort stations (toilets), lighting. With Alternates: 25,700 S.Y. stabilizing subgrade, 25,700 S.Y. concrete paving.

OFFICIAL PROPOSAL

RATE: $2.10 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

NATIONAL COVERAGE

Positions Vacant | **Civil Service Opportunities . . .** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
Part Time Work | **Selling Opportunities Offered** | **Labor Bureaus**

DISPLAYED —**RATES**— **UNDISPLAYED**

The advertising rate is $28.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on a column—3 columns—10 inches to a page.
Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Box Numbers counts as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y. for March 8th issue closing February 27th

OVERSEAS CONSTRUCTION

OPENINGS NOW & IN IMMEDIATE FUTURE FOR:

. . . Design Engineers
. . . Lab Engineers
. . . Draftsmen
. . . Inspectors
. . . Party chiefs
. . . Instrument Men
. . . Rodmen

(On overseas Airbase Mail Detailed Resume.)

P-8825, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ASPHALT PROJECTS

ENGINEER TO HANDLE ALL PHASES OF ASPHALT OPERATIONS BY PLANT OWNERS. STEADY EMPLOYMENT, STATE COMPLETE QUALIFICATIONS TO

P-9342, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

INSPECTOR ENGINEER

Graduate Mechanical Engineer with minimum 3 years' experience in work involving thorough knowledge of the materials and equipment used for oil producing, refining and supporting facilities. Knowledge A.P.I. and A.S.M.E. and other production codes required. For New York office, however, job requires extensive travel throughout the U. S. to inspect and approve purchased equipment and materials.

Salary commensurate with education and work experience. Liberal benefit program. Write outlining personal history and work experience.

Recruiting Supervisor, Box 114

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Heavy Construction Superintendent considerable experience heavy concrete work, sewerage & waterworks construction, general heavy underground work in N. Y. State. Must be thoroughly competent, able to assume responsible position. Engineering background preferred. Start immediately. Permanent position with advancement for qualified person. P-8926, Engineering News-Record.

Wanted: Bridge & Highway designers with office and field experience by consulting engineering firm in Pennsylvania. Give complete details and salary desired. P-8381, Engineering News-Record.

Having opening for well qualified bridge foreman and superintendent in Florida. Apply to P-9239, Engineering News-Record, giving complete background, references, salary desired, etc.

Estimator: Midwestern Building Contractor. Position permanent, opportunity excellent. Furnish experience record, salary desired, address. P-9182, Engineering News-Record.

Excellent permanent opportunity for qualified office man, under 35, with accounting training and experience in construction, but latter not essential. College graduate preferred. Send experience record to Cunningham Brothers, Inc., General Contractors, Beloit, Wisconsin.

Male Help Wanted: Experienced structural steel detailers. Only men experienced in making detail drawings for fabricating shop need reply. Excellent working conditions with opportunity for advancement for good men. Give references and salary expected in application. Southern Engineering Company, Charlotte, N. C.

Teaching positions available in civil, mechanical engineering. Write Administrative Dean, Fresno State College, Fresno 4, California.

WANTED
Registered Engineer
Must be experienced in field layout work and qualified to work on project under contract with Ohio Highway Department. Work to begin about April 1, 1956. Contact B. H. Launder:
LAUNDER & SON, INC.
Sta. E, Box 6, Toledo 9, Ohio
WAlbridge 1542.

POSITIONS VACANT

Estimator—With field experience on heavy construction work and underground utilities such as water and sewage treatment plants; pumping stations; excavation and earth moving jobs; sewer and water lines; site work; drainage, etc. Reply by letter to Virginia Engineering Company, Inc., General Contractors, Newport News, Virginia, giving field and office experience, age, education, phone number, salary, when available, etc. Permanent position for man meeting our requirements.

Structural Steel Draftsmen. Excellent opportunity for two experienced structural steel detailers with progressive Mid-West fabricating plant. Five day week, generous fringe benefits. Send brief resume of training and experience to P-9229, Engineering News-Record, including salary requirements. Company will arrange for personal interview and pay moving expenses for qualified applicants.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems. State experience, age, salary required, when can report, and give references. Reply P-9290, Engineering News-Record.

Graduate engineer, mechanical or civil, with actual job operational experience with major national construction or engineering firm or marine construction firm for sales engineering position representing American Hoist & Derrick Company in the Texas, Louisiana and Tennessee area. Send complete confidential resume to the President, American Hoist & Derrick Company, St. Paul 1, Minnesota.

(Continued on page 91)

ENGINEERS
ENGINEERS
ENGINEERS

WE ARE A distinguished international company pioneering in all phases of radically new industrial design and construction, including Atomic Energy. A company with limitless future in the new age we are helping to create by a fast moving, really professional team of

ENGINEERS

WE WANT Qualified electrical, structural mechanical, and architectural

ENGINEERS

WE OFFER Excellent salaries, all fringe benefits, good working conditions, high management cooperation and above all, magnificent advancement opportunities for career minded

ENGINEERS

Engineers who wish to investigate these opportunities should submit a resume stating their education, experience and salary requirements to:

THE H. K. FERGUSON COMPANY
ENGINEERS AND BUILDERS
1783 East 11th Street — Cleveland 14, Ohio

DESIGN ENGINEERS

McKEE's expansion program has created many new openings in our Refinery, Metals and Industrial Divisions.

These are permanent positions with excellent opportunities for advancemen in one of the world's largest engineering organizations.

With a fifty-year history of successful operation and continuous growth, McKee designs and constructs Petroleum Refineries, Chemical Plants, Blast Furnaces, Steel Plants, Ore preparation Facilities and Industrial Plants all over the world. This wide diversification offers a variey of opportunities to qualified engineers, with no age limitations, in the following fields:

PIPING LAYOUT, STRUCTURAL STEEL, CONCRETE, PROCESS HEATERS, EQUIPMENT SPECIFICATIONS, LAYOUT AND PROCESS DESIGN. ALSO ELECTRICAL AND PIPING DRAFTSMEN.

McKee offers you top compensation for your work plus the security of a life-time pension. Other benefits include insurance, hospitalization, training program and paid vacations.

Ideal working conditions are provided in large, well-lighted, air-conditioned quarters furnished with the most modern equipment. Ample free parking space is available on the premises.

Adequate housing in good residential communities is available in Cleveland and surrounding suburbs. Excellent schools and colleges offer educational advantages. McKee makes generous allowances for transportation and moving expense. Interviews will be arranged for those who qualify. Reply by letter giving education and experience. All letters will be answered and kept strictly confidential. PLEASE WRITE TO:

Edward A. Kolner

ARTHUR G. McKEE & COMPANY
2300 Chester Avenue
Cleveland 1, Ohio

DESIGN ENGINEERS

STRUCTURAL - MECHANICAL PROCESS

Minimum 2 yrs. Experience in Design of Chemical and Industrial Plants

Permanent Position For Qualified Men

ALL BENEFITS
NO AGE LIMITATIONS

Send Resume:

WESTERN-KNAPP ENGINEERING CO.
760 FOLSOM ST.
SAN FRANCISCO 7, CALIF.

GRADUATE CIVIL ENGINEER

Excellent opportunities with nationally recognized organization engaged in engineering service work in highway and concrete fields. Location Kentucky and adjacent states. Permanent position. Salary based on qualifications and experience. Car allowance and expenses. Excellent benefits and retirement program.

P-9271, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

TUNNEL MEN

Superintendents

Walkers

Shifters for Shaft and Tunnel Department

Contracting Division, Dravo Corporation

Tunnel job lasting about 30 months.

Location:
Pittsburgh, Pennsylvania.

Write giving full details of experience and qualifications to

W. P. WARNER,
Dravo Corporation,
Fifth and Liberty Avenues,
Pittsburgh 22, Pennsylvania.

CONSTRUCTION EQUIPMENT ENGINEER
(Supervisory)

Graduate engineer with minimum 7 years' experience designing, selecting, specifying and/or supervising operations of construction equipment, such as crawlers, rubber-tired tractors, shovels, cranes, air compressors, welding machines, pumps, mixers, spreaders, fork lifts, etc.

To consult with manufacturers and suppliers on selection and modification of the above-mentioned equipment. For company's Equipment Engineering Division located in New York City. Salary good; liberal benefits.

Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 89

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

ENGINEERS WANTED

Professional and Sub-Professional for Highway and Flood Control work

PAID
Vacations — Sick Leave — Holidays

PART PAID
Health Insurance — Retirement
Excellent Working Conditions
Progressive California County
Civil Service Status

FIELD POSITIONS
Project Engineer — Instrument Man
Resident Engineer — Inspectors
Chief of Party

OFFICE POSITIONS
Design Engineer — Plans Engineer
Draftsman

WRITE . . .
SAN BERNARDINO COUNTY CIVIL SERVICE
236 Third Street, San Bernardino, Calif.

FLORIDA SEEKS ENGINEERS!
STATE ROAD DEPARTMENT
HIGHWAY PLANNING PROGRAM

Limited number permanent positions open for experienced highway planning personnel for work in following classifications and monthly pay scales:

Senior Designer	**$480 - 600**
Designer	**$400 - 500**
Draftsman	**$340 - 440**

Experience necessary in one or more of following classifications: Urban street design; expressway design; rural highway design; engineering cost analysis; drafting pertaining to contract plan preparation for rural and municipal highway projects.

Positions open in Tallahassee, Chipley, Bartow, Lake City, Fort Lauderdale, DeLand, and Daytona Beach. Excellent working conditions, job security assured under a Merit System, retirement plan, sick leave with pay, paid vacations, hospitalization plan available. Apply, listing education and experience, to:

DIRECTOR OF PERSONNEL
STATE ROAD DEPARTMENT
TALLAHASSEE, FLORIDA

TECHBUILT
55 BRATTLE STREET CAMBRIDGE 38, MASS.

Opportunity unlimited for top management position in fast-growing national factory-produced house building company. Other openings also. Salary commensurate with experience and ability. Reply giving full qualifications to Assistant to President. Only written applications considered.

STRUCTURAL ENGINEER

Structural steel designer and estimator for industrial buildings and miscellaneous steel structures. Applicant should be graduate engineer, preferably 35-45 years old, with a minimum of 5 years of actual structural steel design experience. Permanent employment with top pay, paid vacations, group insurance plan, pension plan. Excellent opportunity. Location is in Mid-West. Employer is nationally known, well established steel fabricator.

Reply fully, giving resume of experience, education, age and salary requirements to

P-8946, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS
Designers Detailers Draftsmen
for work on
Bridges, Expressways, Turnpikes

PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY
PAID VACATION, SICK LEAVE HOSPITALIZATION, LIFE INSURANCE
INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
1805 GRAND AVE. KANSAS CITY 8, MO.

BECHTEL

ENGINEERS & DESIGNERS

MECHANICAL —
Design experience in one or more of the following fields:
Instrumentation and controls for Industrial Equipment, Refinery and Chemical Plant Processes, Steam Power Plants, Materials Handling Equipment, Metallurgical Process Equipment such as metallurgical furnaces, kilns, crushers, or related heavy machinery, heating and ventilating, or industrial plant layout.

ELECTRICAL —
Responsible design experience on panel boards, industrial controls, power distribution or lighting.

STRUCTURAL —
Design or detailing experience in structural steel and/or re-inforced concrete for industrial projects.

CIVIL —
Design experience in one or more of the following fields: Site layout, roads, railroad, drainage, or hydro-electric project.

PIPING —
Designers with drafting and layout on high temperature high pressure piping.

Immediate openings in our SAN FRANCISCO offices for men with above stated job experience.

BECHTEL CORP. is a progressive engineering and construction firm engaged in world-wide operations.

LIBERAL RELOCATION ALLOWANCES COVERING APPLICANTS, FAMILY & HOUSEHOLD EFFECTS

BECHTEL

Engineers - Constructors

Send Resume:
5 West 45th St. New York 17, N. Y.
220 Bush St., San Francisco, Calif.

Confidential interviews can also be obtained at: Scanlon Building, Houston, Texas, or Roosevelt Building, Los Angeles, Calif.

Graduate Civil Engineers

Not over 27 and single. Must have military training completed and interested in the building construction business, starting in the field. We offer opportunity for rapid advancement to ambitious, hard-working young men willing to accept responsibility. Starting salary $92.50 per week if unexperienced, with higher wages for those with some experience.

Send complete history data.

Martin K. Eby Construction Co., Inc.
610 N. Main, Wichita 5, Kansas.

ENGINEERS

HIGHWAYS AND BRIDGES
Designers
Draftsmen
Office Engineers
Maintenance Engineers
Project Engineers
Location Engineers
Soils & Materials Engineers

Domestic and Overseas Assignments
Knowledge of Foreign language necessary in some classifications.

ARCHITECTS

Architectural Draftsmen

Write, giving full particulars concerning education, experience, personal history and availability to:

Richard L. Shaw
Personnel Director

Michael Baker, Jr., Inc.
Consulting Engineers
Baker Building **Rochester, Penna.**

ENGINEERS

Designers - Detailers - Tracers

for work on
Bridges, Expressways, Turnpikes

PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY

King & Gavaris
CONSULTING ENGINEERS
425 Lexington Ave. New York 17, N. Y.

Due to our expansion program, the following permanent positions are available in a large pulp and paper manufacturing plant in the Upper Midwest:

Design and Construction Estimator
Instrumentation Engineer
Piping Design and Layout Engineer
Heating and Ventilating Engineer

The individuals being sought should be graduate engineers with a minimum of five to ten years experience who are well versed in their respective fields. Our employees know of these openings. Your confidential reply should include personal, educational and work history together with salary thinking. Write

P-9199, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

PROJECT ENGINEER

Young and aggressive organization looking for man 35 to 50 years old with highway and bridge design experience to head office in Midwest. Must be licensed. Salary commensurate with ability and experience. Submit resume.

P-9234, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

INDUSTRIAL ENGINEERS

College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

Mechanical Structural Electrical Engineers Draftsmen

Varied and interesting positions in a progressive consulting office. Long range program, excellent working conditions, employee advantages include profit sharing bonus plan, and insurance benefits.

Send complete resume of experience and qualifications to:

SAMBORN, STEKETEE & ASSOCIATES, J. H. V. EVANS
Engineers and Architects
1214 Cherry Street
Toledo 4, Ohio

ENGINEERS

STRUCTURAL
HIGHWAY
ELECTRICAL

for work on
Bridges, Expressways, Turnpikes

PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY

PAID VACATION, SICK LEAVE HOSPITALIZATION, LIFE INSURANCE

INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
55 Liberty St. **New York 5, N. Y.**

WANTED: ASS'T TRAFFIC ENGR.

For traffic engineering department just recently established. Salary range $554 to $670 a month with maximum salary obtainable through annual and longevity increases. Registration as a professional engineer required. Applications accepted until the needs of the service are filled. Write Personnel Department, City Hall, Madison 3, Wis.

POSITIONS VACANT
(Continued from page 87)

Designers and checkers also squad leaders steel or concrete. For expanding organization on industrial and power plant work. Overtime and advancement, liberal benefits. Marbarry Corp., 140 Nassau Street, N.Y.C., COrtlandt 7-0322.

Chief of Party—Must be capable of handling survey parties and have thorough understanding of survey work pertaining to rights of way, curb and street lines, sanitary and storm sewer surveys, and general survey work. Apply by appointment—Office of Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Transit Man—For inside and outside work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance, and tax map work. Apply by appointment—Office of Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Estimators for all trades. Relocation unnecessary. Good pay plus profit dividends. Address resume and references to Construction Survey Co., 101 Park Avenue, N. Y. 17.

Sales Representative for A-1 all-trade estimating service in your town. Commission plus profit dividends. Send resume and references to Construction Survey Co., 101 Park Avenue, N. Y. 17.

Estimator—Company doing diversified business in industrial, commercial, institutional, and residential construction solicits inquiries and resumes from experence building estimators. Continuous employment is offered to qualified applicant. Age limit 42; Location—Central and Western Florida. State salary requirements and availability date. Charles Construction Corp., P. O. Box 112, St. Petersburg, Fla.

Civil Engineers — Senior — Junior — College graduates—by established public utility supervisory-consulting organization. Senior—minimum 7 years experience—Junior—minimum 3 years, for work in connection with design hydro systems, also structural and foundations for steam, hydro, and diesel plants. Location New York—some travel future. Reply stating age, education, experience, personal particulars and minimum salary expected. P-9334, Engineering News-Record.

Structural designers and draftsmen with at least two years recent experience in engineer's office. Miami location with good opportunities. Give complete information and salary desired. P-9192, Engineering News-Record.

Construction Superintendent: Good layout man with some experience in surveying. Prefer men with sewer and sewage treatment construction background, however an experienced all-around supervisor will be considered. Excellent working conditions and good pay for a qualified man. Contact Mr. L. Mozzone, 118 Kendall Ct., Dover, N. J.

Engineers and Architects—Federal Aid Airport Program, the Civil Aeronautics Administration, Region 1, New York International Airport, Jamaica, New York, needs engineers for permanent field assignment at Boston, Massachusetts, Columbus, Ohio and Harrisburg, Pennsylvania and staff assignments in New York. The Administration is currently engaged in an expanded program of Federal Aid to States and Municipalities for airport construction and development. Job opportunities for engineers and architects are available at these locations at minimum salaries ranging from $5,140.00 to $7,570.00 per annum. Liberal sick leave, vacation, life and health insurance at low rates, retirement coverage and National merit system promotions.

Engineering graduates with experience in the testing and control of placement of soils, concrete and asphalt mixtures for work immediately abroad and in New England for an engineering organization of sixty years in business. Give full details of experience and education. Salary range $5,000 to $10,000 per year. P-9305, Engineering News-Record.

When Answering BOX NUMBERS . . .

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS VACANT

Hydraulic Engineer: The State of New Jersey has need for civil engineers experienced in open channel hydraulics or water supply investigations. Positions under Civil Service with retirement pension provisions. Entrance salary $4,980 to $5,460, depending on qualifications. For further information, write Division of Water Policy and Supply, 520 E. State St., Trenton 25, New Jersey.

Wanted—Construction superintendent experienced in paving operations (primarily hot-mixed asphalt). Must be able to take complete charge of work in Missouri and Illinois. Reply stating qualifications and salary desired. Bridges Paving Company, 1337 South Kingshighway Boulevard, St. Louis 10, Missouri.

Wanted Engineer experienced in estimating and field supervision of sewers, water, gas and drainage work. Complete charge of company and make all contacts. Will sell shares up to 30% if wanted. Work in middle west, good opportunity for right man. Opening new company for a well known construction co. Have equipment already on hand. State age, experience and salary in first reply. P-9335, Engineering News-Record, 520 N. Michigan Avenue, Chicago 11, Illinois.

Structural Engineer—Must have experience with concrete, as well as steel construction—from tri-state area covering Pittsburgh, Cleveland, Columbus, Wheeling and environs—preferably over 40 years of age with sales experience. Opportunity as Executive Vice President of construction company. Stock options possible. Furnish picture, experience record and present salary. Application will be kept confidential. P-9340, Engineering News-Record.

Teacher. Graduate and undergraduate structural courses. Asst. Prof. PhD. or good experience. Research opportunities. Also two instructors. Start Sept. '56. Univ. of Colo. at Boulder.

POSITIONS WANTED

Master Mechanic or Equipment Supt. heavy earth moving, concrete and asphalt plant erection, experienced in all phases of repair, operation, maintenance and shop management of heavy equipment. PW-9170, Engineering News-Record.

Proven executive engineer available soon for managerial, operational, marketing, or pioneering position with firm desiring development of business in inland southwestern states. B.S., bilingual, much travelled. Write aims to PW-9233, Engineering News-Record.

Mech. Struct. Des. engr. conveyors machinery struct. steel bldgs. hvy. equipt. etc. PW-9288, Engineering News-Record.

Chief Engineer & Estimator—Age 32. 30 years top flight successful experience mostly in competitive building field. Have had full responsibility for preparation of estimates on large jobs for many years with very successful record profitwise. PW-9281, Engineering News-Record.

Construction Executive, buildings and heavy construction, sound experience bid to completion, qualified to manage a project, branch office or a business, seeks new connection where top man is required. Minimum $15,000, PW-8792, Engineering News-Record.

Chief Estimator, project manager, construction executive, available for association with active, competitive general contractor. Proven profitable record for 15 years. Salary bracket $15,000 per year. PW-8855, Engineering News-Record.

WORK WANTED

Detailers—Experienced in all phases of stret. & misc. steel detailing, available to handle add. work for fabricator. S. Kuchma Co., 2555 Dorr St., Toledo 7, Ohio.

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

UNDISPLAYED	RATES	DISPLAYED
$2.10 a line, minimum 3 lines. o figure advance payment count 5 average words as a line.		The advertising rate is $23.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
BOX NUMBERS count as one line additional in undisplayed ads.		AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page.
DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.		EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW ADVERTISEMENTS to N. Y. Office, 330 W. 42nd St., N. Y. 36, N. Y. for March 8th issue closing February 27th

SPECIAL SERVICE

Do you need fast and accurate designs and complete drawings of simple, continuous, rigid frame bridges; steel or concrete; also culverts. Several registered engineers offer this service and welcome inquiries. SS-9341, Engineering News-Record.

Engineers—Foremen—Office Men
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

PUMPCRETE
Current Models Sale or Rent
Engineering Service & Parts
R. T. SHERROD
Concrete Equipment Company
Jones Island, Milwaukee 7, Wis.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
WILSON *Engineering Corp*

WANTED
400 Feet 42" Belt Conveyor
225 Feet 36" Belt Conveyor
Complete or in part.
With roller bearing idlers.
Wire—Write—Phone
G. & W. H. CORSON, Inc.
Plymouth Meeting, Pa.

WANTED
USED BULLDOZER
D6 or equivalent 1951 to 1953. Ready to go to work.
W-9339, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERING LIBRARY WANTED
Firm of civil engineers will purchase private library of engineering books and other publications. In replying please furnish list of publications and quote total price.
CLARKESON ENGINEERING CO., INC.
285 Columbus Avenue Boston 16, Mass.

STRUCTURAL STEEL

ANGLES	I-BEAMS	CHANNELS
50 Ton 3 x 3 x 5/16"	100 Ton 3" @ 5.7#	50 Ton 4" @ 5.4#, 7.25#
50 Ton 3½ x 3½ x 5/16"	50 Ton 6" @ 12.5#	50 Ton 8" @ 11.5#
20 Ton 4 x 3½ x ¼"	50 Ton 8" @ 17.25#	50 Ton 10" @ 15.3#
20 Ton 4 x 3½ x 5/16"	50 Ton 10" @ 25.4#	50 Ton 10" @ 20#
20 Ton 4 x 3½ x 3/8"	50 Ton 12" @ 31.8#	50 Ton 10" @ 25#
20 Ton 3½ x 3½ x ¼"	50 Ton 12" @ 35#	50 Ton 12" @ 20.7#
20 Ton 3½ x 3½ x 5/16"		50 Ton 12" @ 25#
20 Ton 3½ x 3½ x 3/8"		50 Ton 12" @ 30#
20 Ton 4 x 3 x ¼"		
20 Ton 4 x 3 x 5/16"		
20 Ton 4 x 3 x 3/8"		
20 Ton 5 x 3½ x ¼"		
20 Ton 5 x 3½ x 5/16"		
20 Ton 5 x 3½ x 3/8"		

All material listed is in 40, 45, and 60' lengths.

ALAN STEEL COMPANY, INC.
1241 SEARLES ROAD TOLEDO, OHIO
Phone: FRanklin 1611

DON'T WAIT
WF-H BEAMS
PILE SECTIONS
NEW · USED · IN STOCK

pcs	8" B P	36#	19/35'
"	10" B P	42#	45/50'
"	12" B P	53#	60/65'
"	14" B P	73#	60/65'
"	14" B P	89#	60/65'

We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

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Amer. Manganese Steel Div., Amer. Brake Shoe Co. 64
Armco Drainage & Metal Prod., Inc. ... 58

Barber-Greene Co. ..... 3rd cover
Belmont Iron Wks. 70
Berger & Sons, Inc., C. L. 61
Bethlehem Steel Co. 10
Blaw Knox Const. Equip. Div., Blaw Knox Co. 11
Blood Bros. Machine Co. 71
Bruning Co., Inc., Charles 81
Byers Co., A. M. ..... 2nd cover

Cement Gun Co. 82
Clark Equip. Co. (Truck) 41
Columbia Southern Chem. Corp. 43
Concr. Granding Corp. 72

Detroit Diesel Eng. Div., G.M.C. 55
Dresser Mfg. Div., Dresser Ind. 35

Eastman Kodak Co. 47
Economy Forms Corp. 95

Fairbanks-Morse Co. 95
Filotecnica Salmoiraghi, Inc. 56
Frederick Post Co. 44

General Electric Co. 48, 49
Goodyear Tire & Rubber Co. 18
Graphic Systems 66
Griffin Wellpoint Corp. 70
Gunite Concr. & Const. Co. 95

Inland Steel Prod. Co. 54
International Harvester Co. (Trucks) ... 53
International Steel Co. 57

Johns-Manville Corp. 77

Kern Instr. Co. 52

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LeRoi Co. 14
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Taller & Cooper, Inc. 83
Texas Co. 4, 5
Thurman Machine Co. 69
Timken Roller Bearing Co. ..... 4th cover

U. S. Rubber Co. 39
Universal Builders Supply 9

Visking Corp. 29
Vulcan Iron Wks. 82

Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 32
Woodward & Dickerson Inc. 71

Yeomans Bros. Co. 80

Professional services 94

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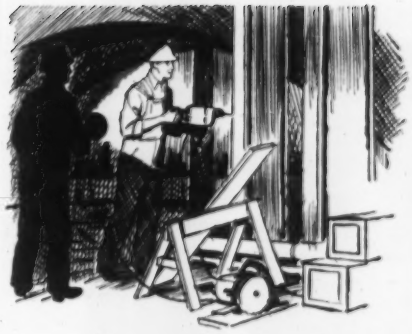
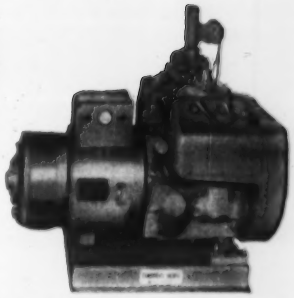
Employment Opportunities 87-91
Educational 91
Proposals 84-87
Equipment (For Rent, Sales Wanted) 91-94





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Editorials

Passamaquoddy Again

THE TERM BOONDOGGLING WAS APPLIED SO FREQUENTLY to the attempt in 1935 to develop a tidal power project in the Bay of Fundy at the Maine-Canadian border that the President's signing of a bill this month authorizing a $3 million survey of tidal power possibilities at that location may appear to be just an invitation to waste more money. It should not be so regarded for at least two reasons: (1) The scheme has never been investigated adequately or dispassionately; and (2) there have been interesting developments in low-head turbines in the past twenty years that may have a bearing on the cost and efficiency of tidal power plants.

The study, which Congress and the President have approved, subject to a Congressional appropriation, is limited to determinations of cost and economic feasibility. Nevertheless, a certain amount of site exploration and project planning would seem to be a necessary corollary. Additional technical studies will unquestionably be required before such controversial points are resolved as the adequacy of the local seabottom materials to support large rockfill dams, or the location and number of filling and emptying gates and powerhouses to produce the most firm power. Moreover, the answers to these questions have a direct bearing on whether power can be generated at a saleable price.

The only circumstance under which this information would be of no value would be on a prior showing that no market for the power exists within economic transmission range no matter how cheap or plentiful the power at the bus bar. This was one of the charges leveled at the prior proposals, and an answer is the first requirement of any new studies.

Assuming, however, that costs of marketing the power seem reasonable, the practicability of the project itself becomes the paramount concern. And in reaching a decision on this score, the investigators will have available some new designs for low-head turbines developed in Europe, and particularly in France where a tidal power project in the estuary of the Rance River in Brittany is close to the contract stage.

The most interesting of these new turbines is a horizontal type, which is submerged directly in line with the flowing water. The generator, of about 10,000-kw capacity, is mounted in the same housing as the turbine, and it is one of the features of the factory-assembled units that they can be installed or removed for servicing in a matter of a few hours. Another feature is that the turbines can double as pumps to supplement the tides in filling the basins. Pumped storage was an element of one of the early Bay of Fundy plans.

There is a third factor favorable to this proposed new study—the plan to turn it over to the International Joint Commission on United States-Canadian Boundary Waters. It will be recalled that the project on which we spent $6 million in 1935 encompassed only the arms of the Bay of Fundy within the U.S.—principally Cobscook Bay—because Canada would not join in the enterprise. All studies have indicated that the much larger Passamaquoddy Bay, wholly north of the border, must also be included if the project is to turn out enough firm power to be practicable.

It was largely because President Roosevelt insisted on going ahead with a project without Passamaquoddy Bay that even some of the enthusiasts for Fundy tidal power had to agree with the boondoggling label. The late Dexter P. Cooper, who originated the Fundy scheme, always included Passamaquoddy in his proposals, and only agreed with the Cobscook Bay plan reluctantly. The international character of the new study is, therefore, much to be praised.

When Congress comes to act on the President's request for an appropriation for a new Passamaquoddy study, it will be natural for some to say, "What, again?" But it should be remembered that the unquestionably intriguing project has never been subjected to a really objective analysis. Now that one such has been proposed—at a modest cost and under conditions that are relatively promising for an answer—it should be carried out.

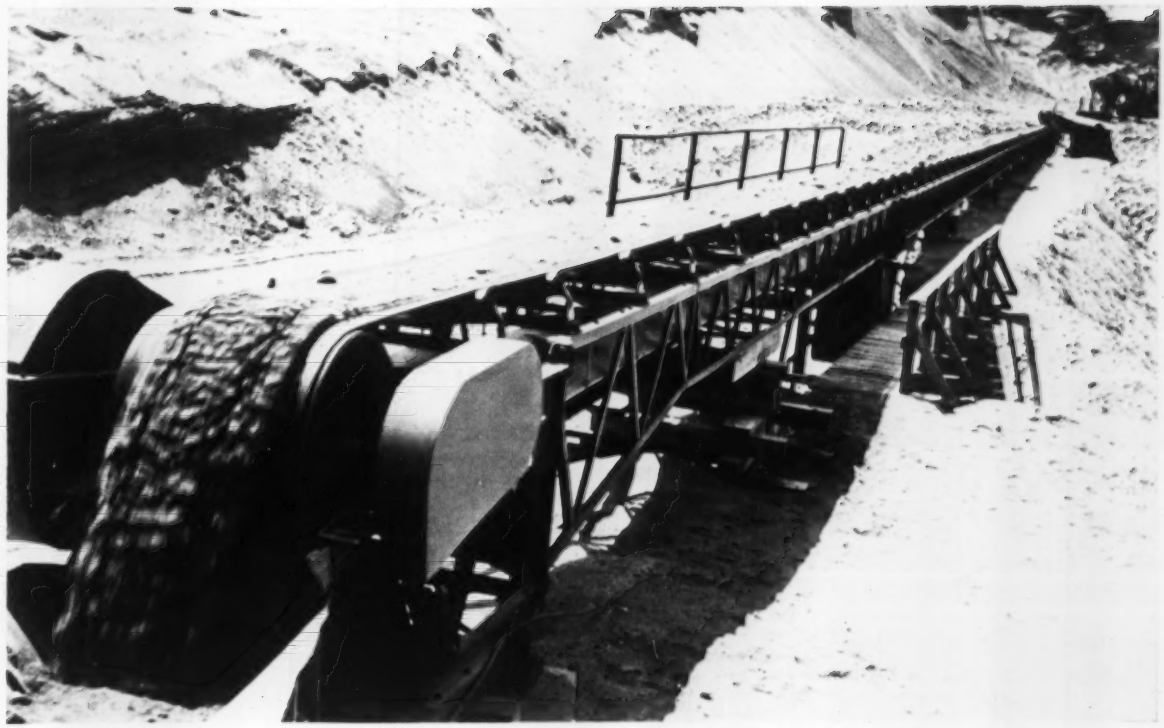
Frank Words on Flood Recovery

THE GOVERNOR OF CONNECTICUT, Abraham A. Ribicoff, recently addressed some remarkably frank words to communities which he felt were lagging in recovering from last August's hurricane-caused floods. He declared among other things that if local government officials ". . . either can't or won't do the job, then you should vote them out of office."

Clearly, the governor hopes that out of the flood catastrophe will come not only adequate flood control measures, but improved civic facilities. He hammered at this theme in flood-ravaged Winsted when he said that in his opinion this city "had been on the skids and was fast going to pot before the floods came. My hope is that it and communities everywhere will have the courage and foresightedness to do redevelopment jobs that will turn the flood catastrophe into a victory for civic betterment."

Such plain talk is needed and should be welcomed by members of the engineering profession who have a responsibility in their local communities to take the lead in setting forth the benefits to be gained both from flood protection work and from city redevelopment.

Last year's floods dramatically awakened many people to the shortcomings in their communities. But the opportunity should be seized before they slumber again.



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Long or short haul—it costs less to move materials with belt conveyors

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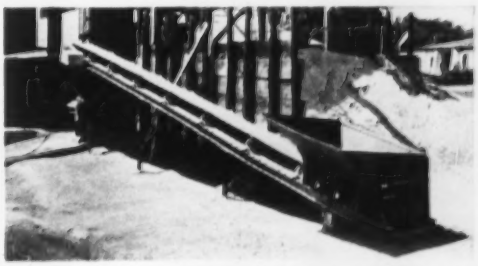

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THE Galion Iron Works & Mfg. Company's ROLL-O-MATIC (torque converter) drive automatically applies the driving force as the work demands—and automatically maintains desired roller speed regardless of grade or working conditions. There's no throttle to adjust, no gears to shift. To make sure the new tandem rollers steer and roll *easily*, Galion engineers use Timken® tapered roller bearings on compression roll, steering roll assembly, and final drive.

Because Timken bearings practically eliminate friction, they make it easier to start rollers moving and keep them moving. Timken bearings cut friction because they're designed to roll true; and because they're made with microscopic accuracy to conform to their design.

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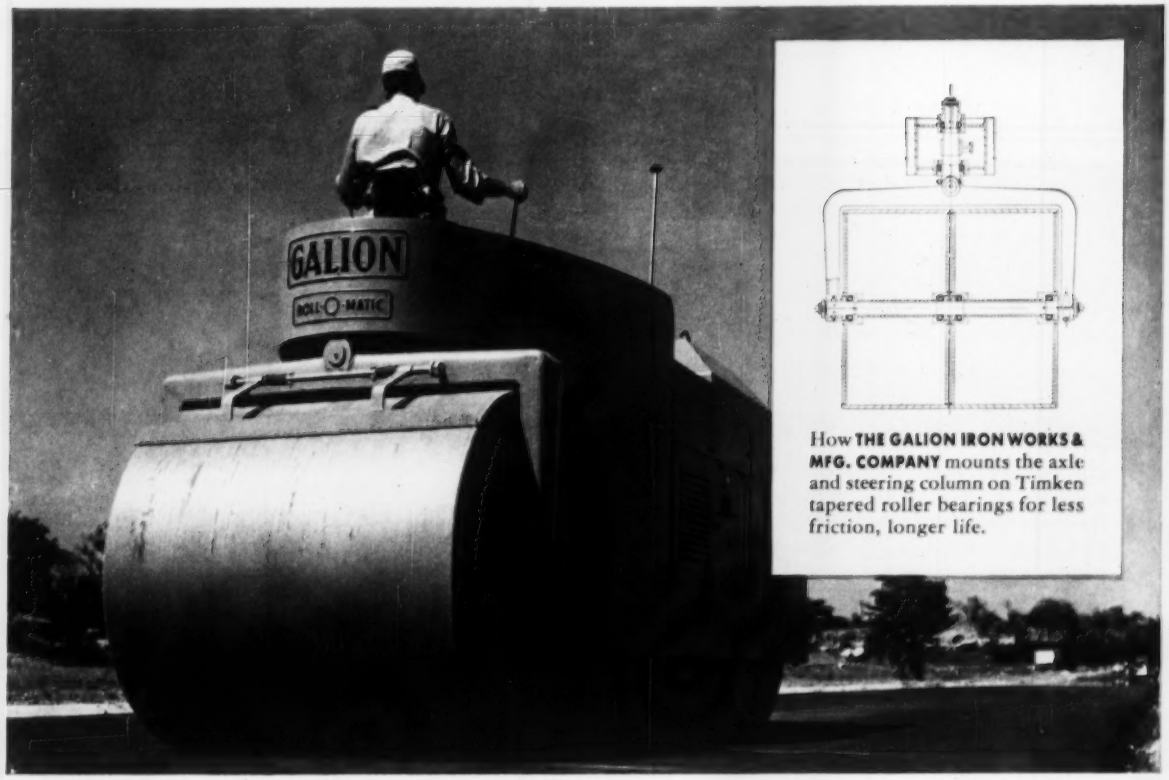
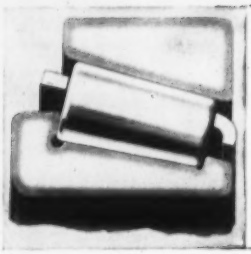
Whether you buy or build machinery, make sure the bearings are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **THE GALION IRON WORKS & MFG. COMPANY** mounts the axle and steering column on Timken tapered roller bearings for less friction, longer life.



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